Evaluation and Projection of Surface $PM_{2.5}$ and Its Exposure on Population in Asia Based on the CMIP6 GCMs

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14 Supplementary figures

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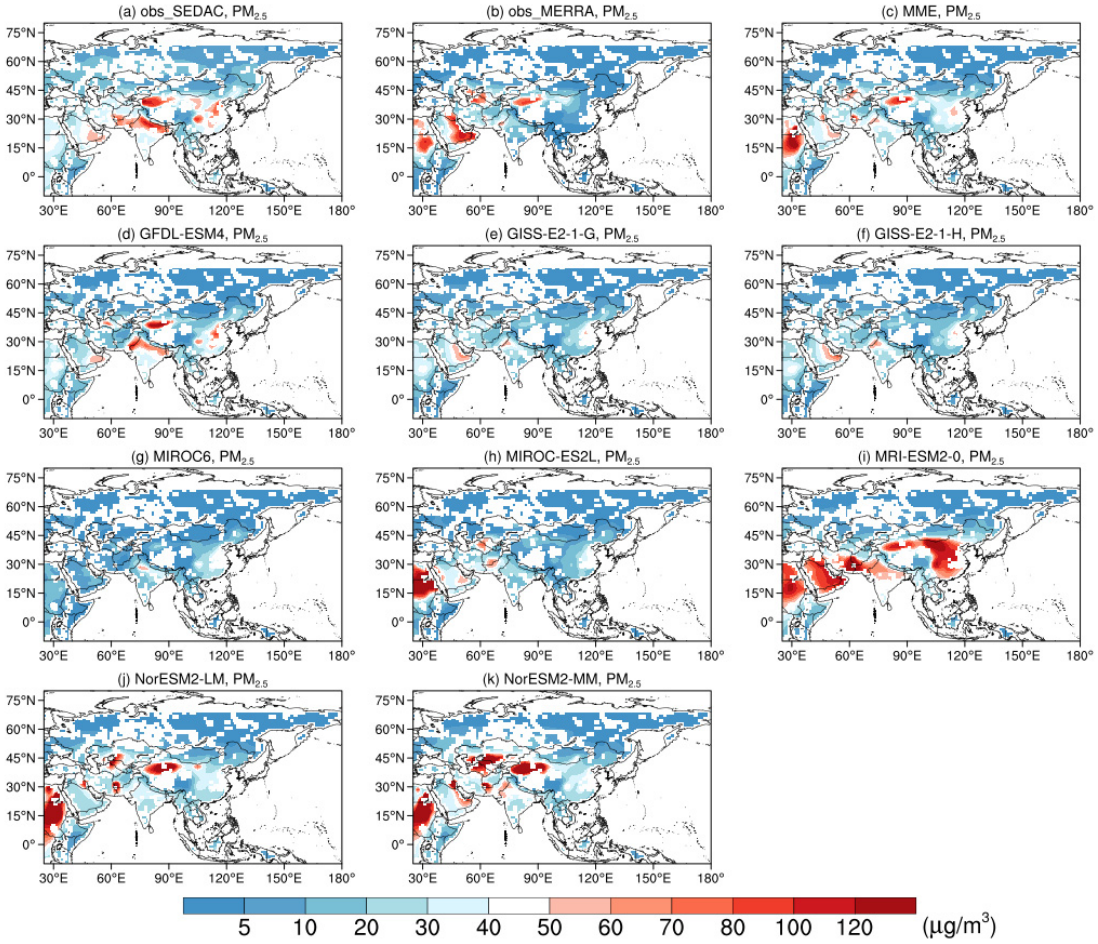


Figure S1. Spatial distribution of annual mean surface $PM_{2.5}$ concentrations (units: $\mu g/m^3$) during 1998-2014 from the observations, the original outputs of CMIP6 models and their bias.

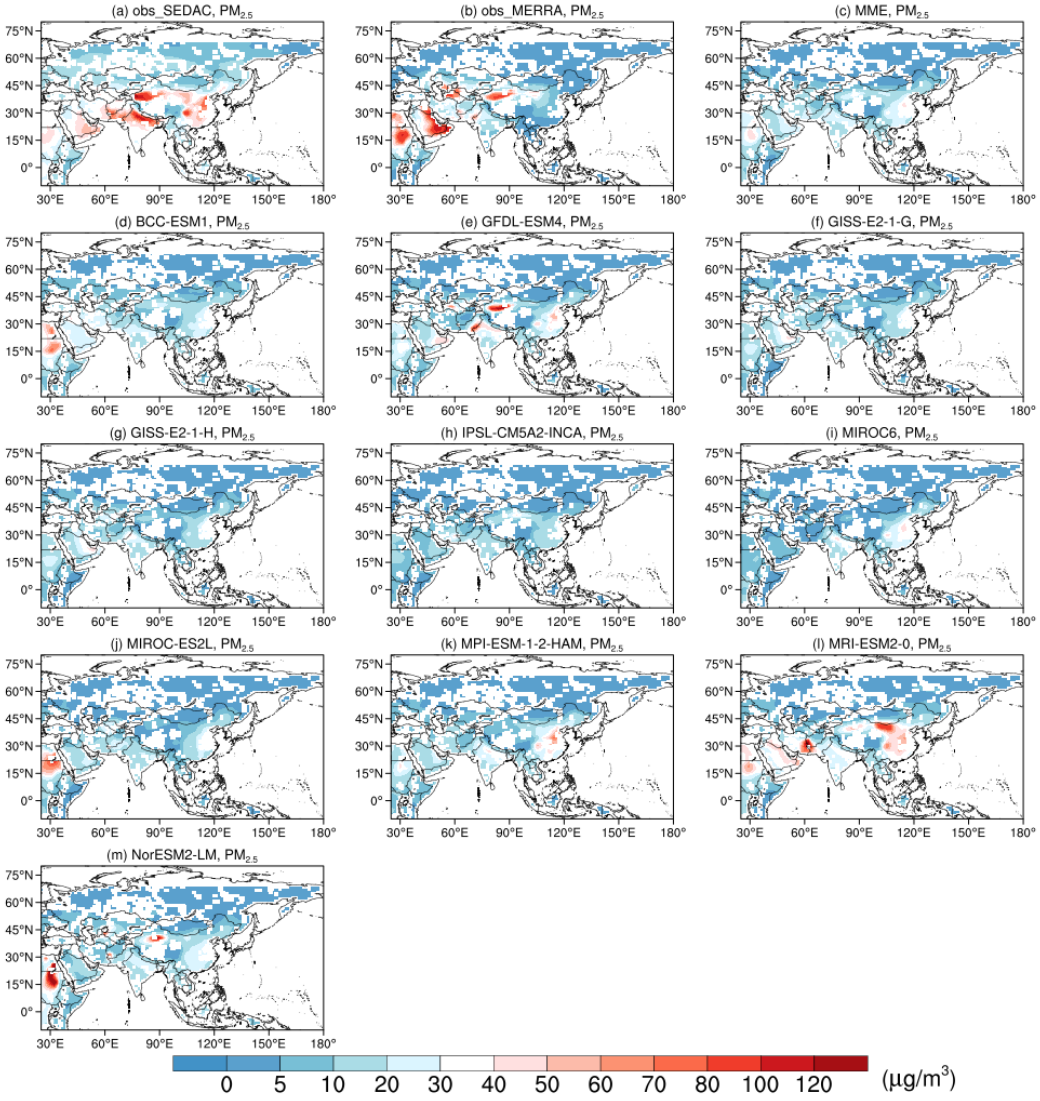
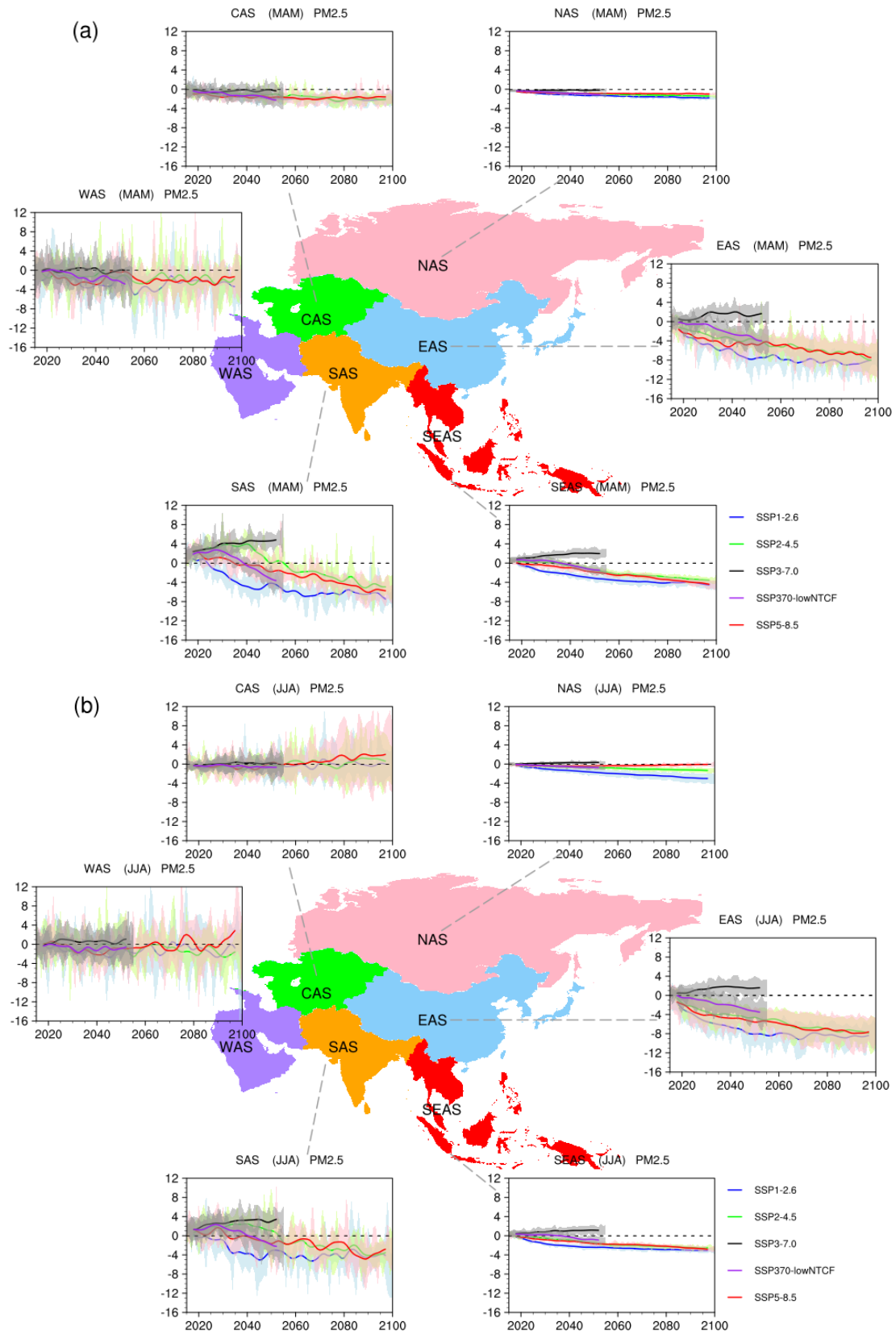


Figure S2. Same as Figure S1, but for the estimated.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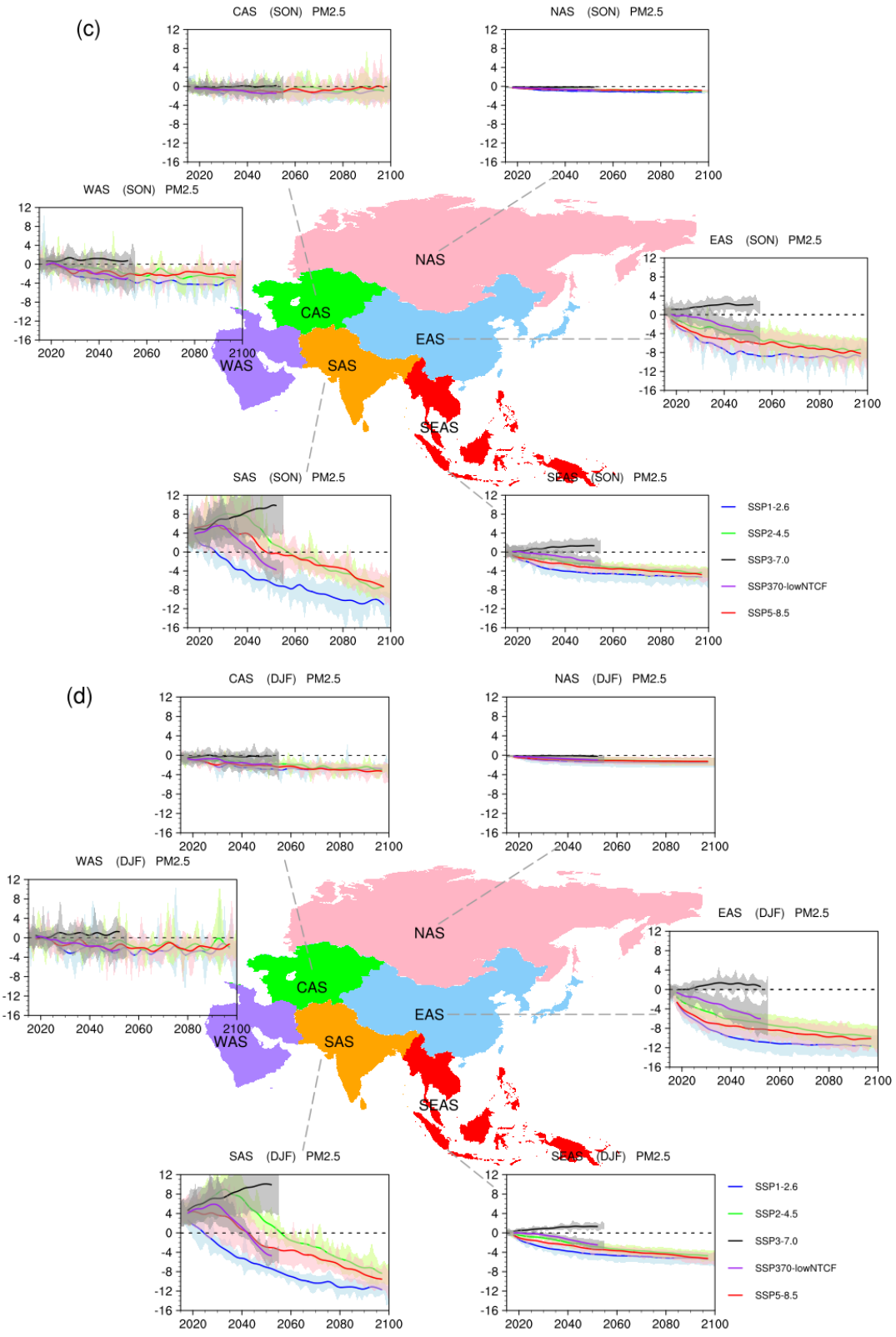
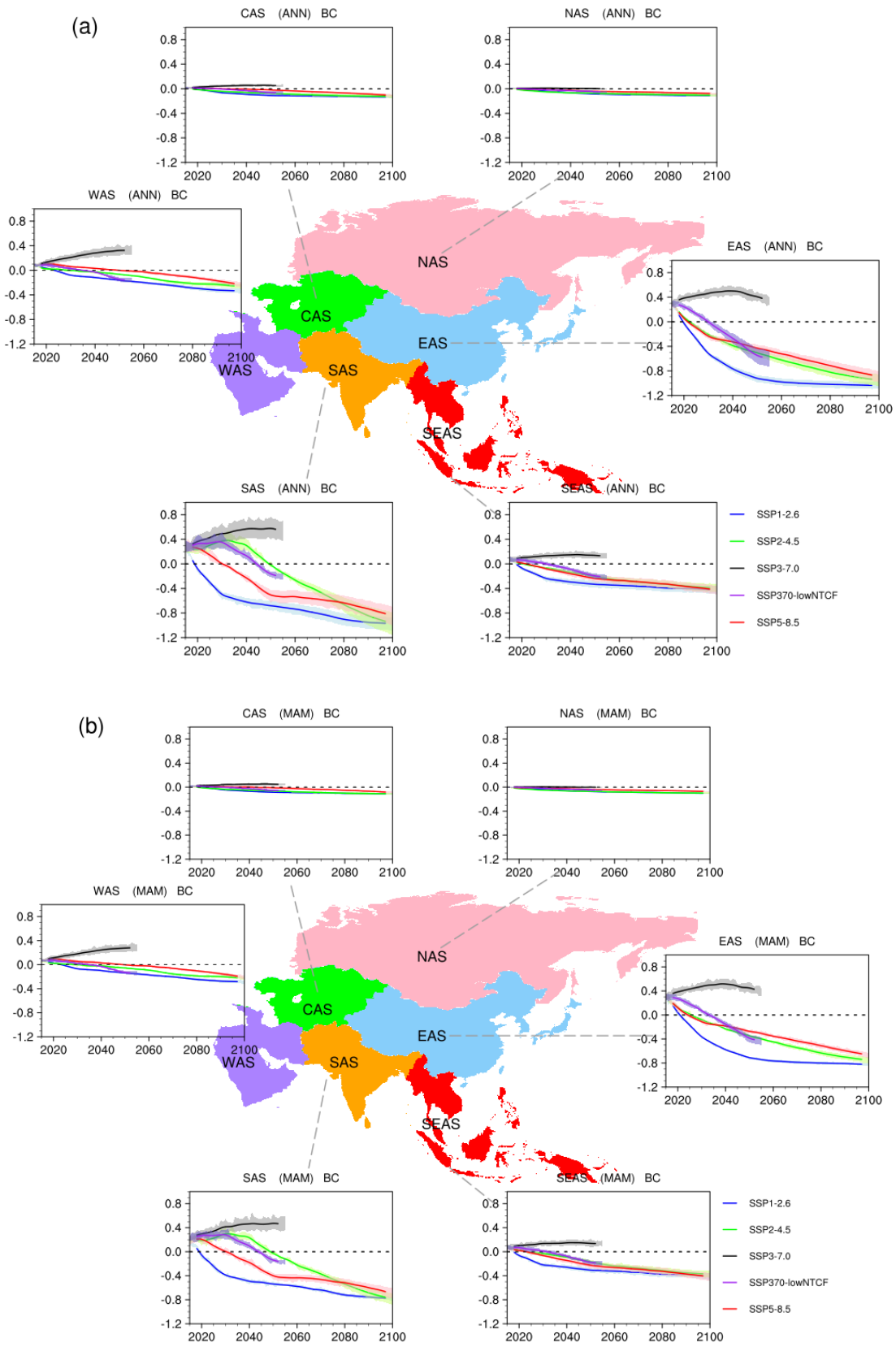


Figure S3 Time evolutions of surface $PM_{2.5}$ concentrations (units: $\mu g/m^3$) in spring(a), summer (b), autumn (c) and winter (d) over Asia under SSP1-2.6 (red curves), SSP2-4.5 (green curves), SSP3-7.0 (black curves), SSP370-lowNTCF (purple curves) and SSP5-8.5 (red curves), relative to 1995-2014, where shadings indicate model uncertainty range (1 standard deviation of the simulations).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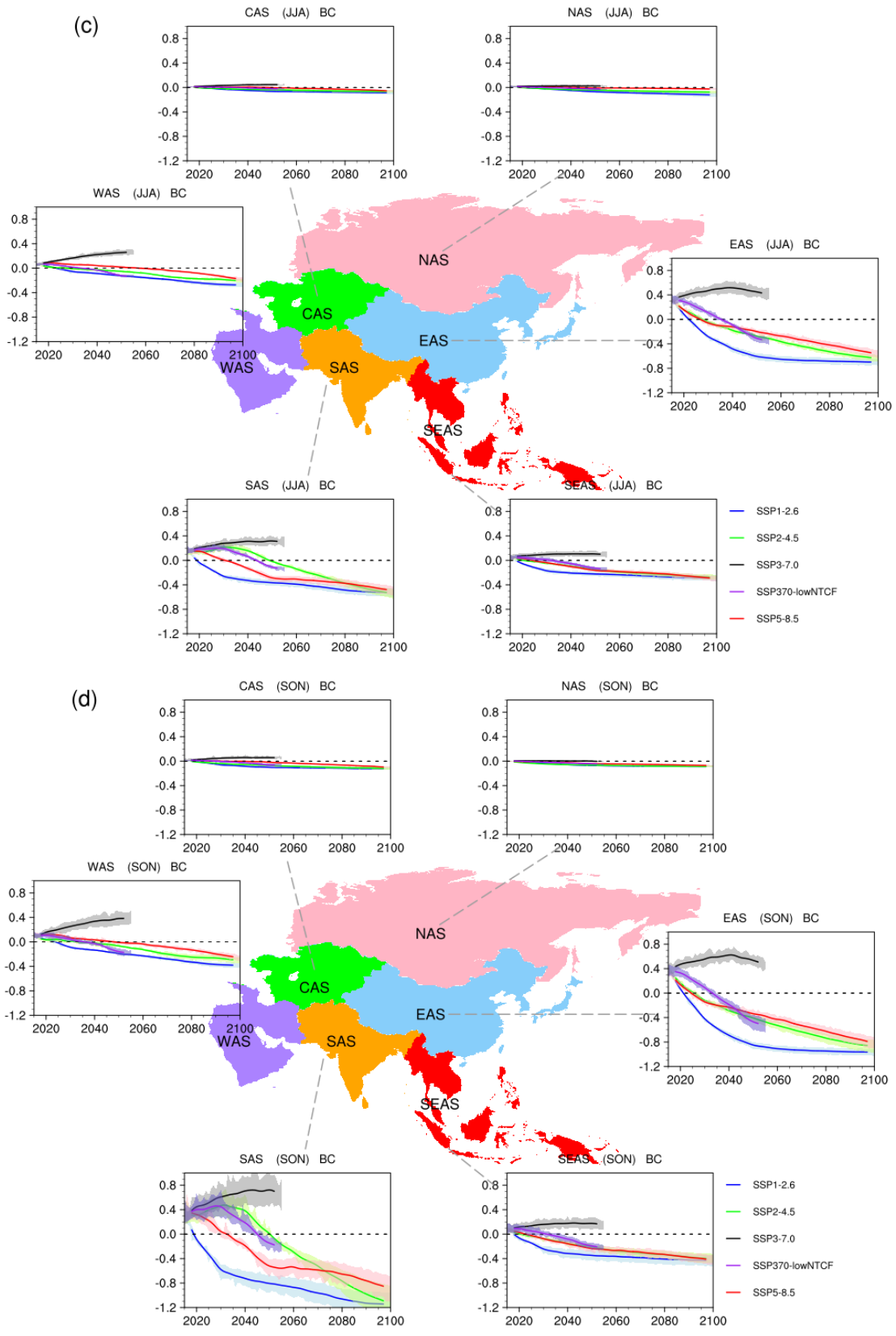
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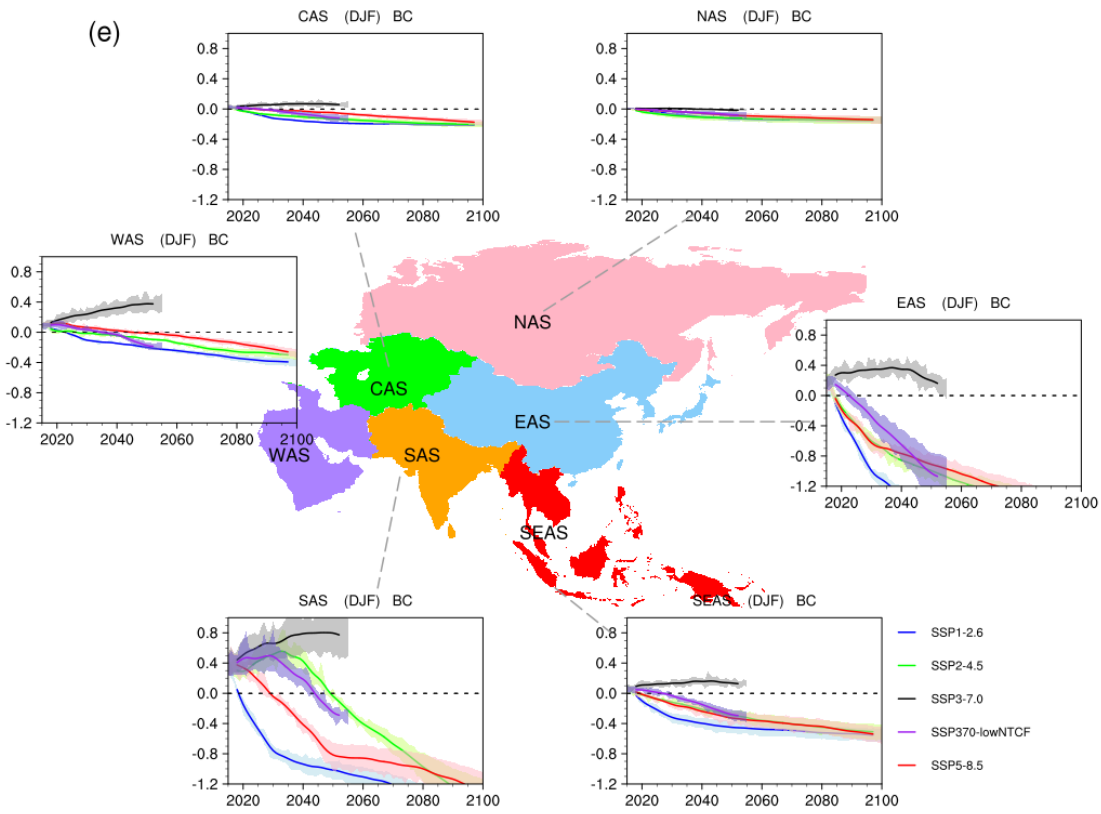
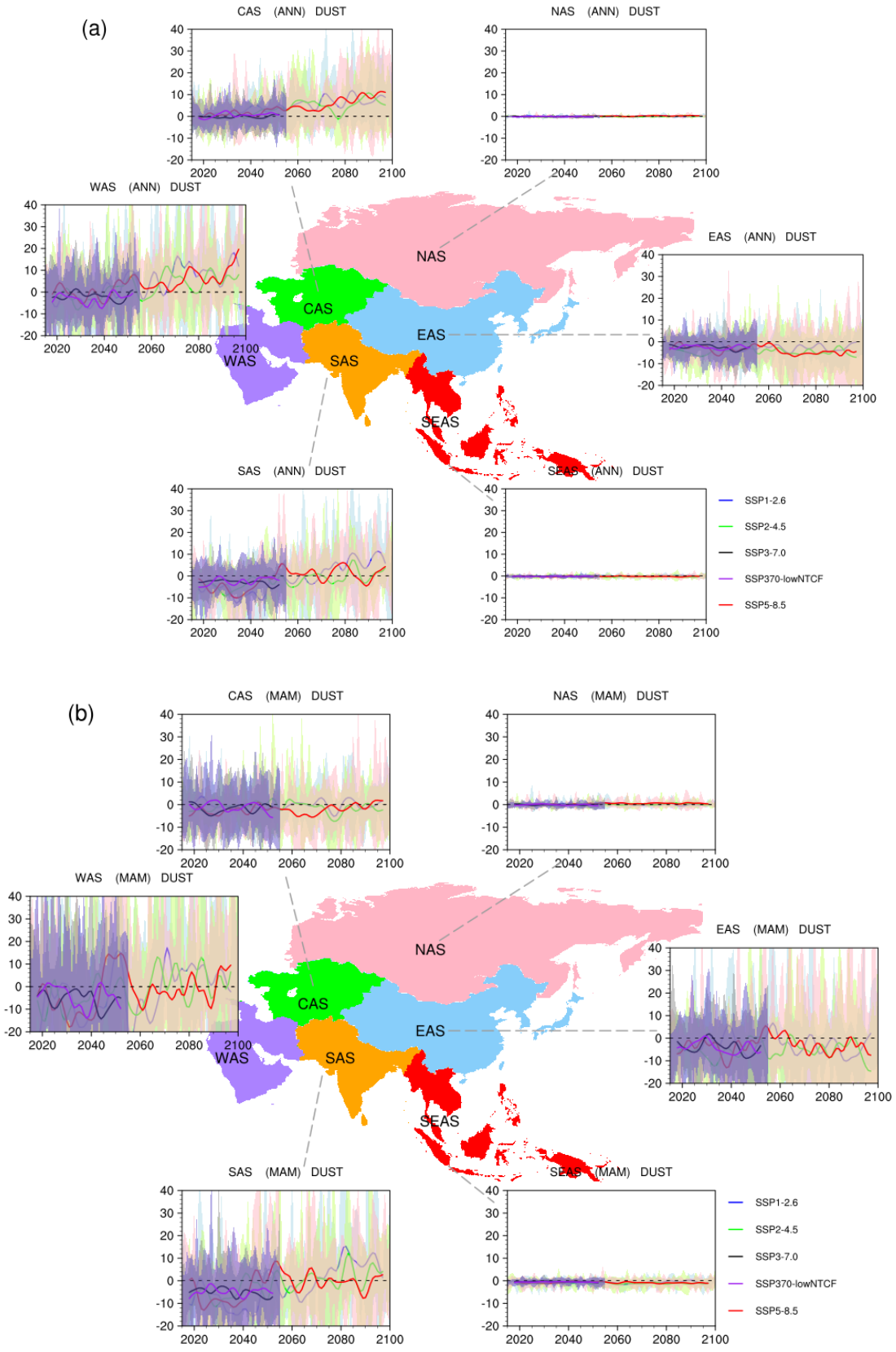


Figure S4 Time evolutions of surface black carbon (BC) concentrations (units: $\mu g/m^3$) in annual (a), spring (b), summer (c), autumn (d) and winter (e) over Asia under SSP1-2.6 (red curves), SSP2-4.5 (green curves), SSP3-7.0 (black curves), SSP370-lowNTCF (purple curves) and SSP5-8.5 (red curves), relative to 1995-2014, where shadings indicate model uncertainty range (1 standard deviation of the simulations).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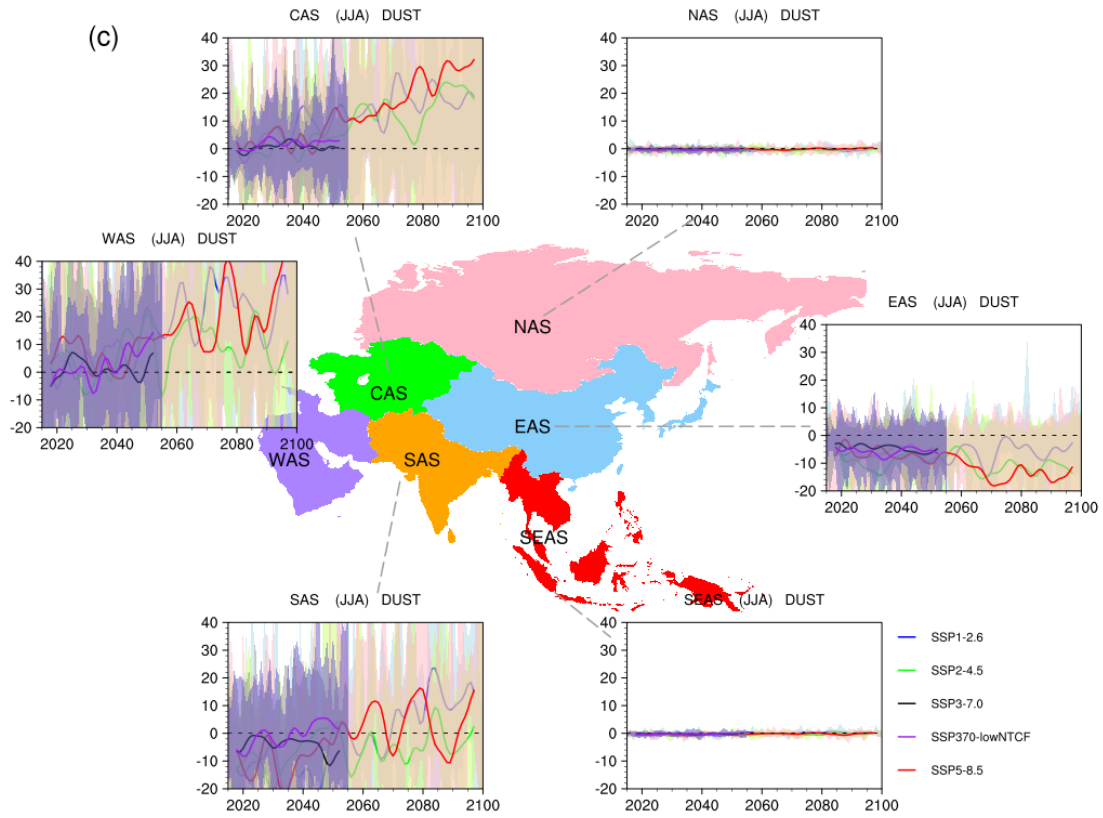
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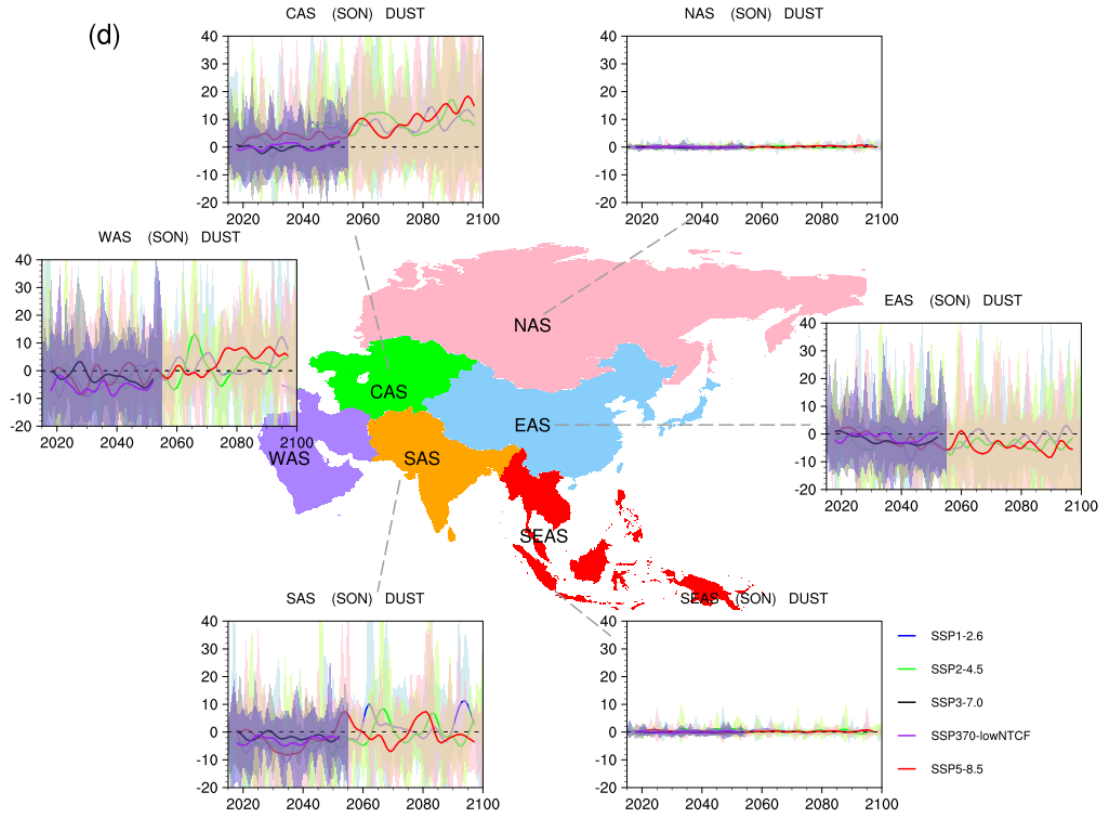
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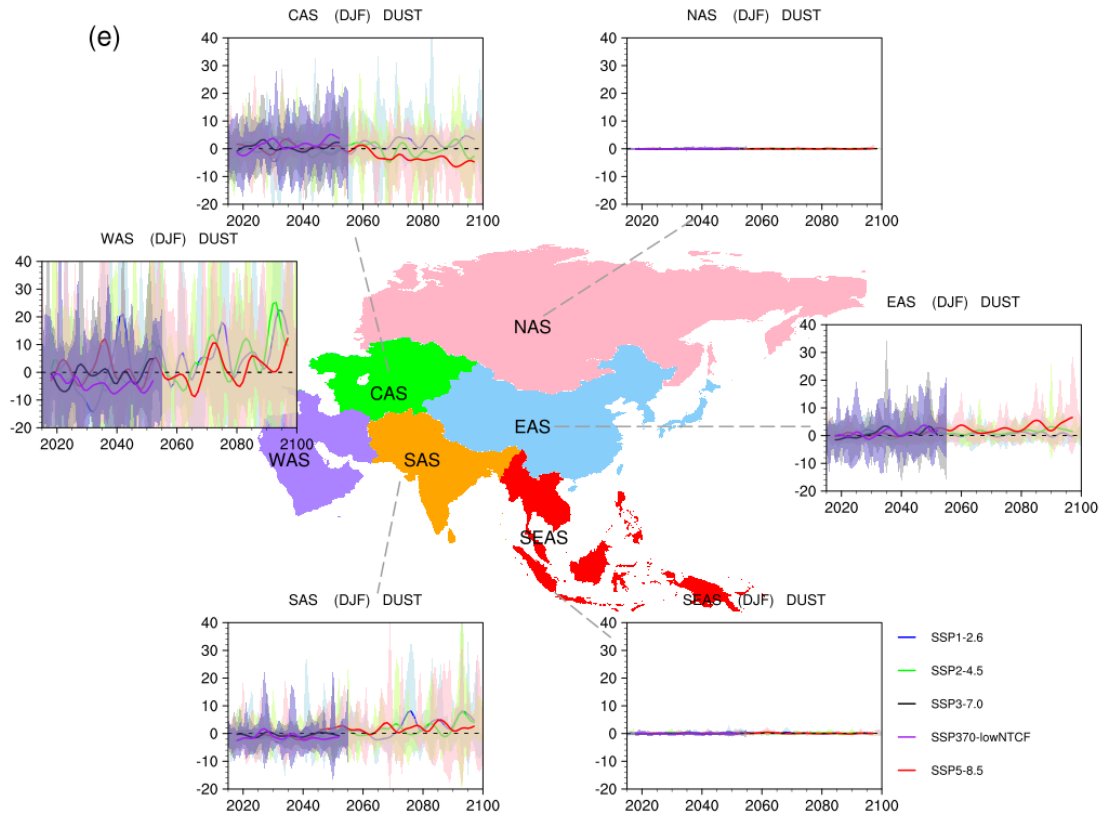

Figure S5 Time evolutions of surface dust concentrations (units: $\mu g/m^3$) in annual (a), spring (b), summer(c), autumn (d) and winter (e) over Asia under SSP1-2.6 (red curves), SSP2-4.5 (green curves), SSP3-7.0 (black curves), SSP370-lowNTCF (purple curves) and SSP5-8.5 (red curves), relative to 1995-2014, where shadings indicate model uncertainty range (1 standard deviation of the simulations).

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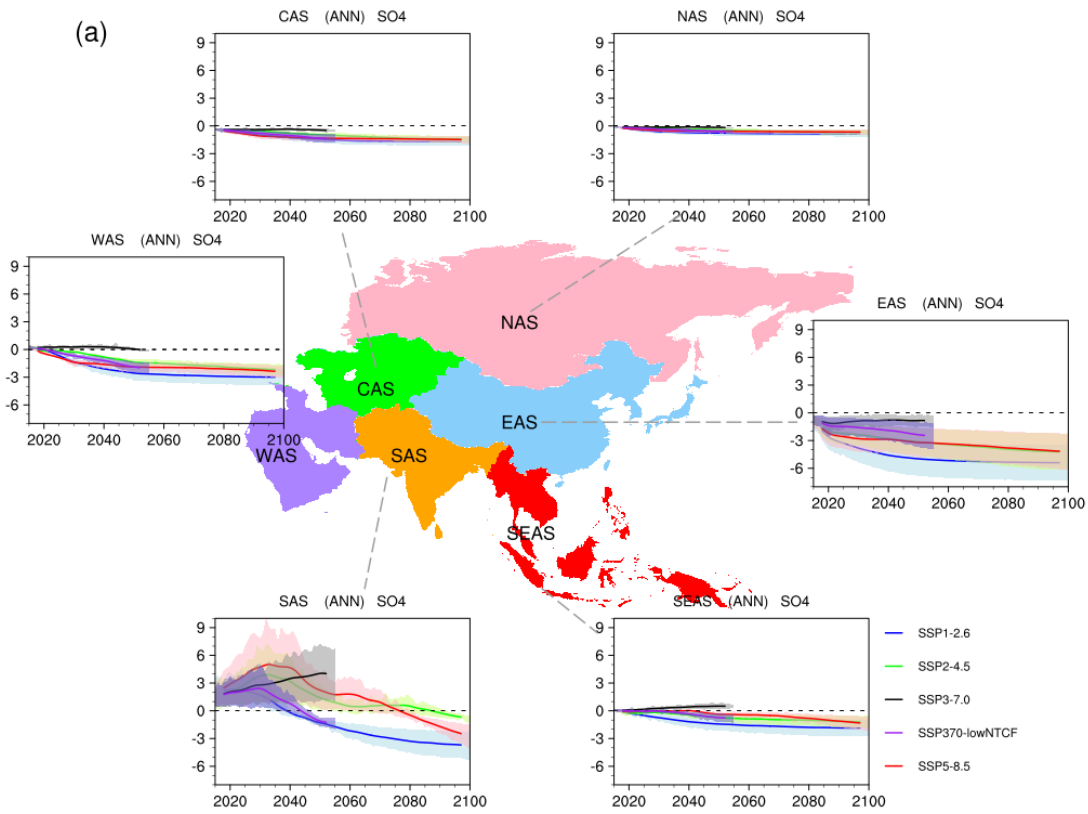
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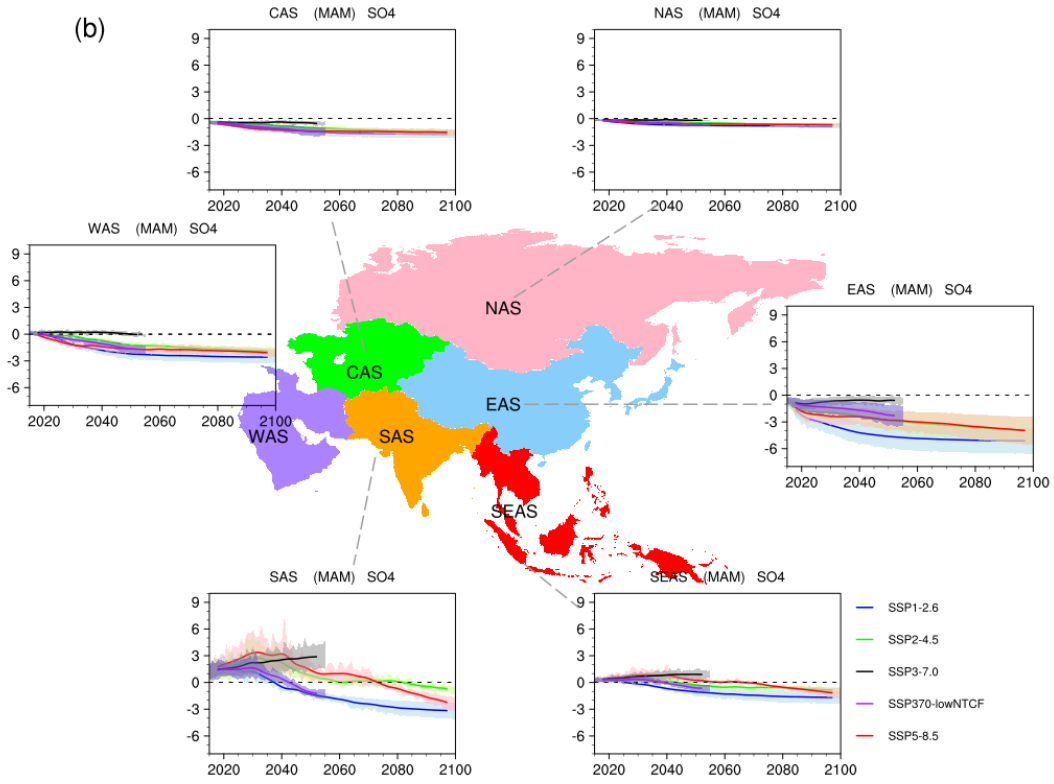
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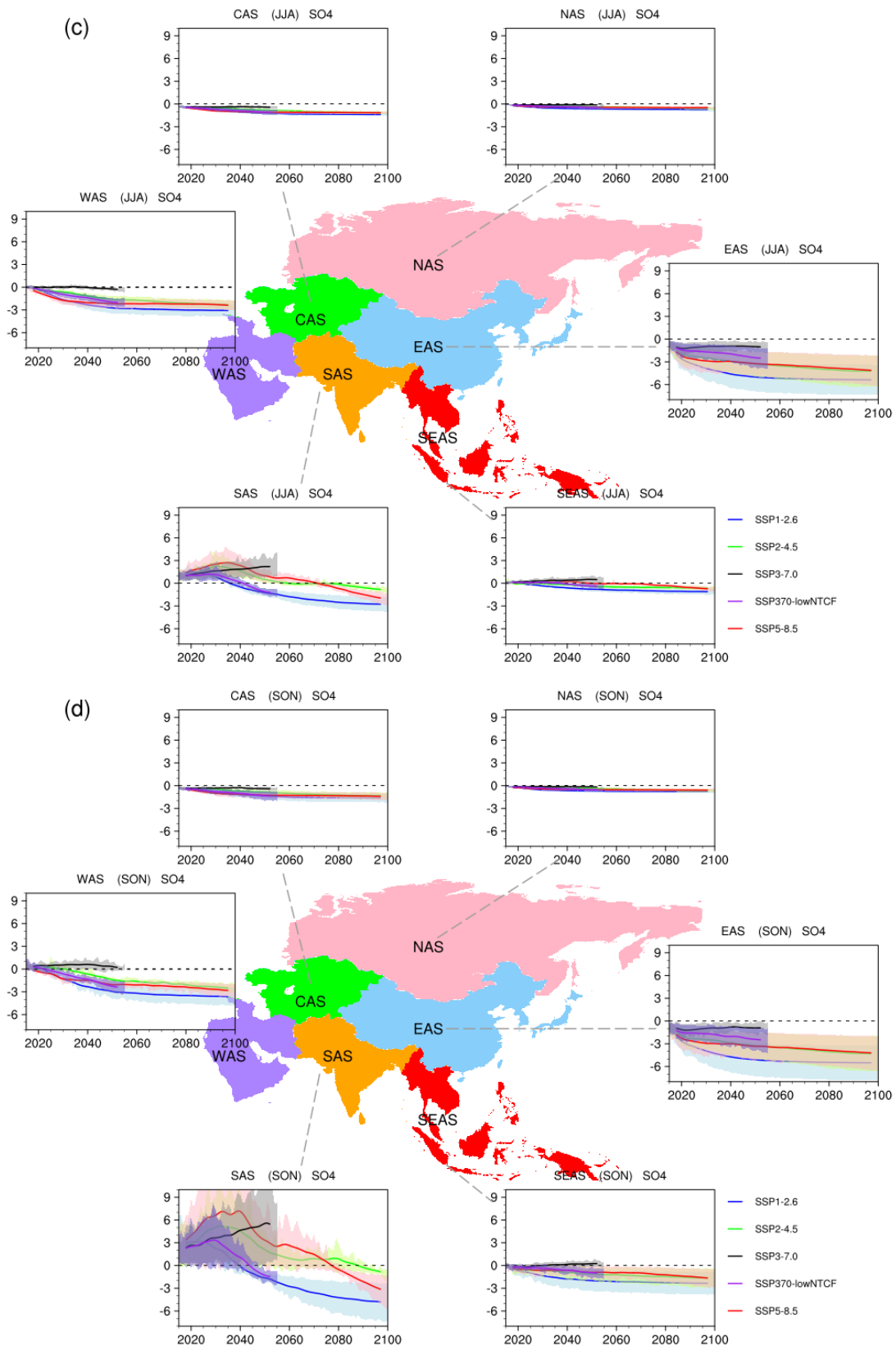
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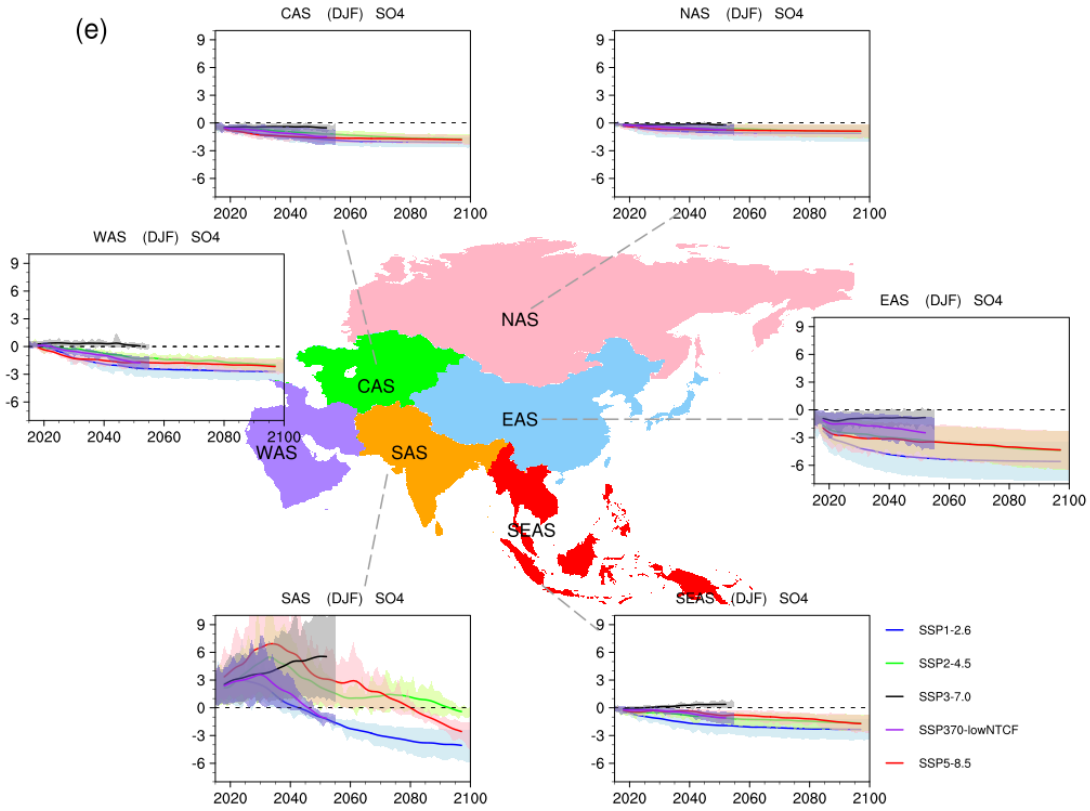
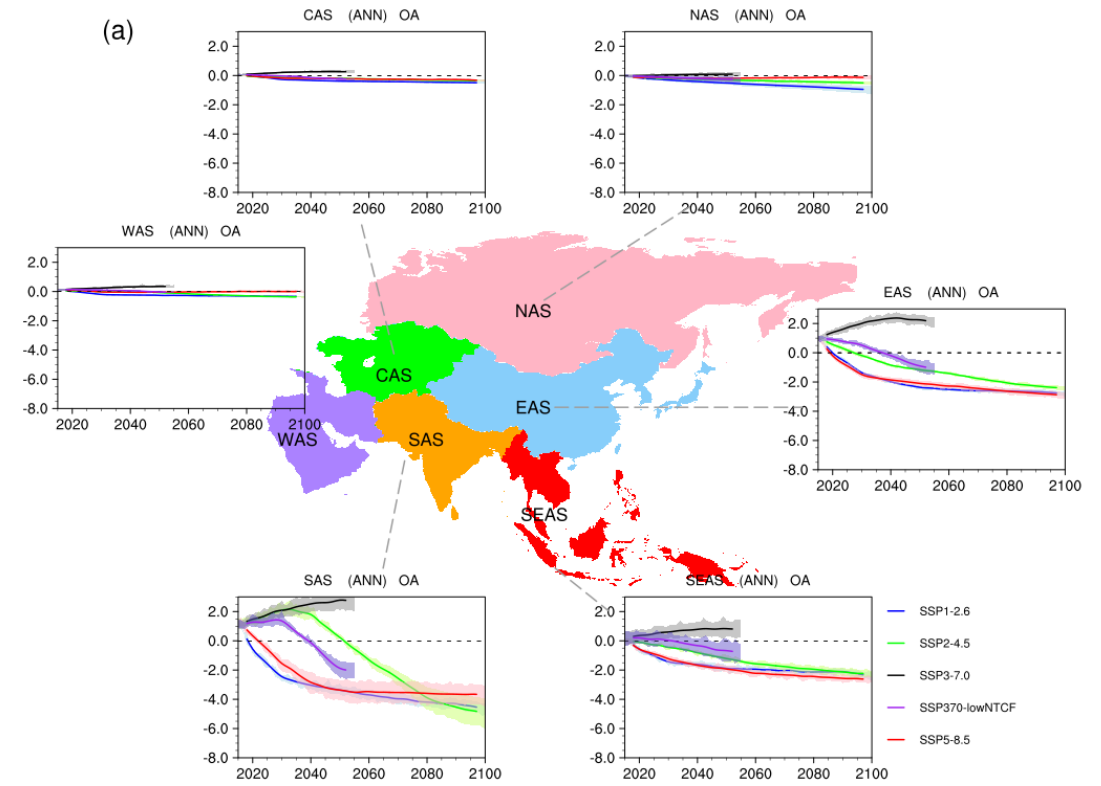


Figure S6 Time evolutions of surface SO_4 concentrations (units: $\mu g/m^3$) in annual (a), spring (b), summer (c), autumn (d) and winter (e) over Asia under SSP1-2.6 (red curves), SSP2-4.5 (green curves), SSP3-7.0 (black curves), SSP370-lowNTCF (purple curves) and SSP5-8.5 (red curves), relative to 1995-2014, where shadings indicate model uncertainty range (1 standard deviation of the simulations).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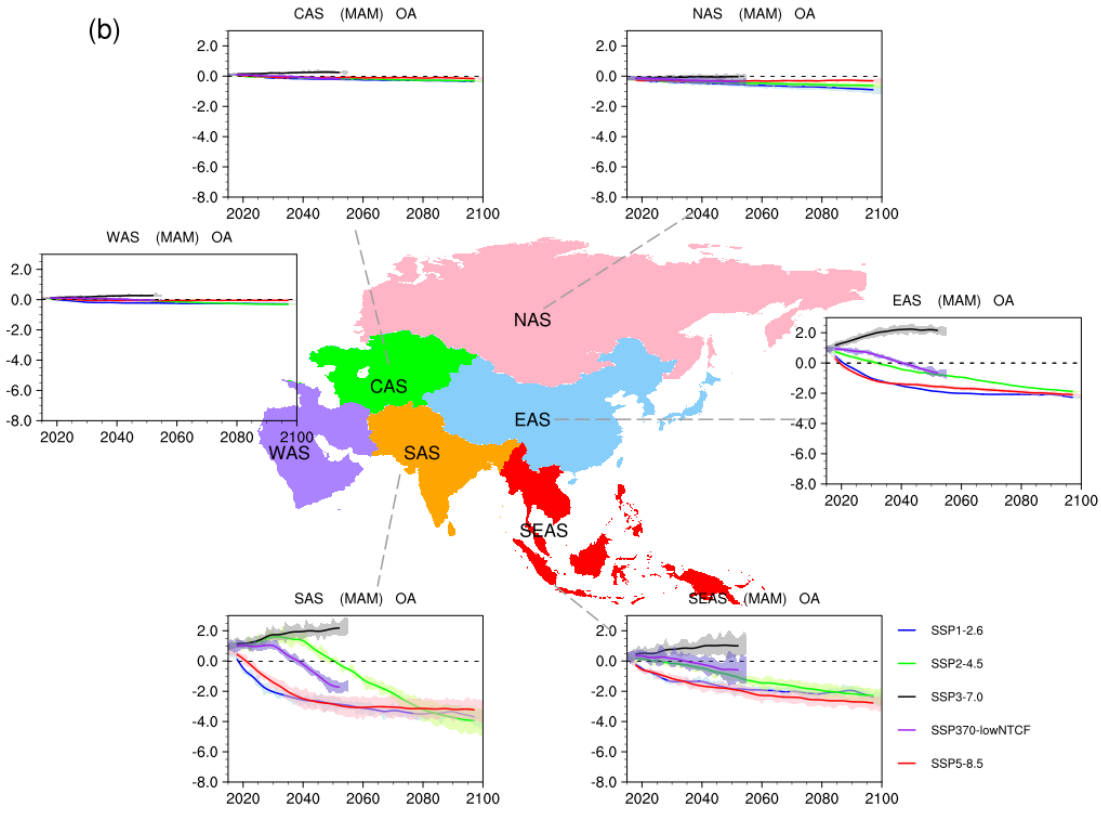
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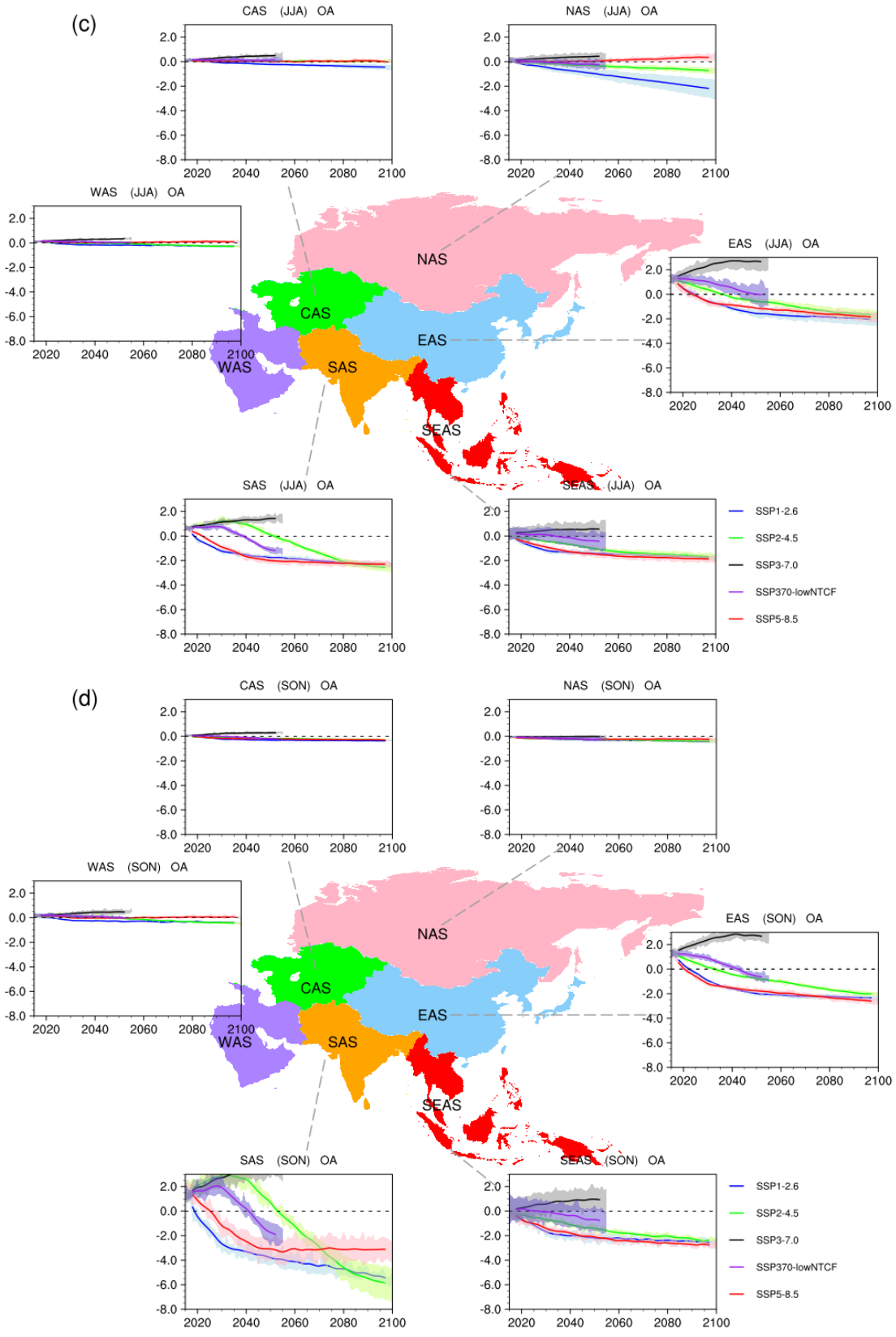
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(d)
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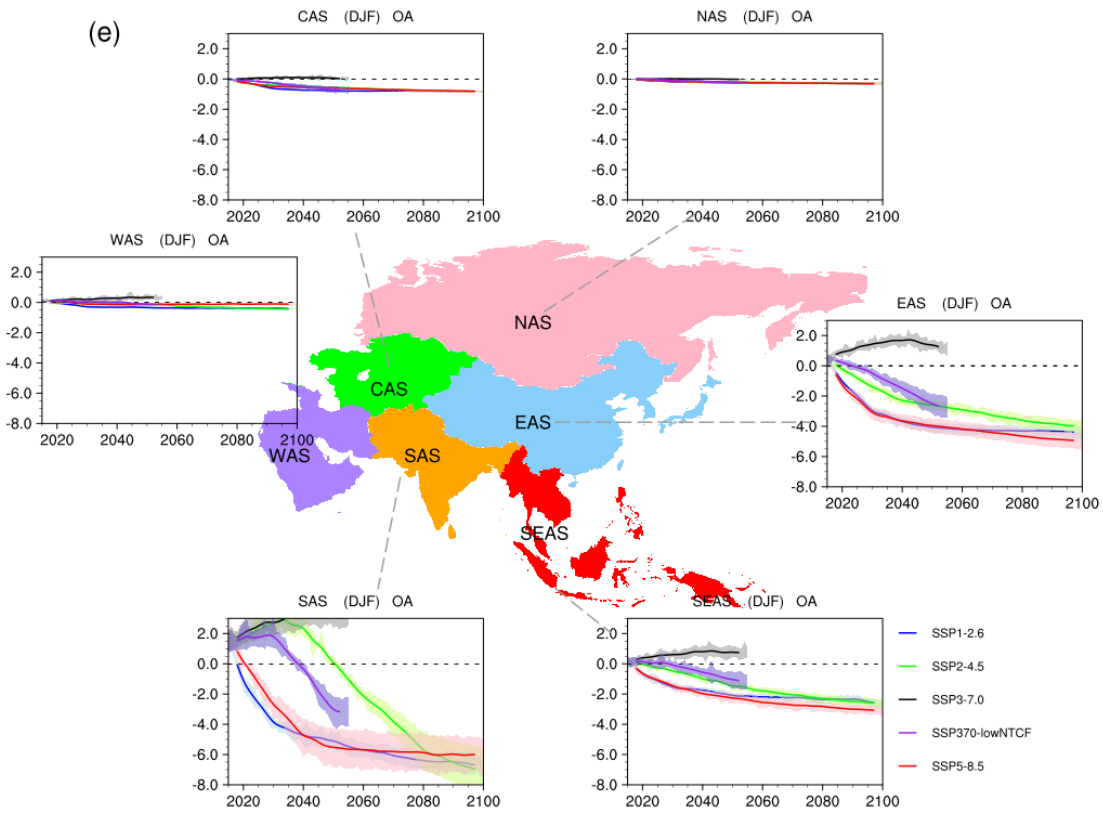
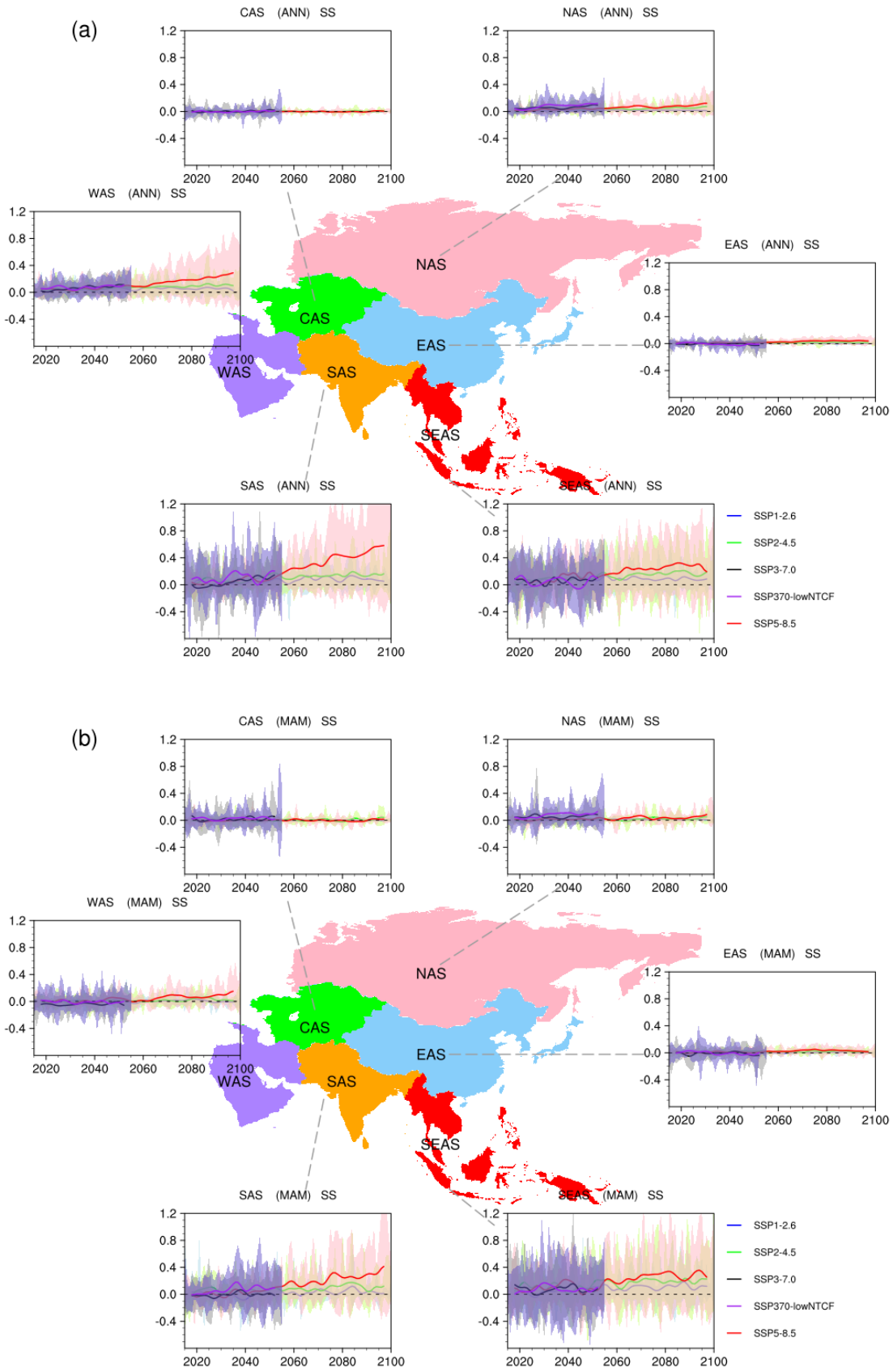


Figure S7 Time evolutions of surface organic aerosol (OA) concentrations (units: $\mu g/m^3$) in annual (a), spring (b), summer(c), autumn (d) and winter (e) over Asia under SSP1-2.6 (red curves), SSP2-4.5 (green curves), SSP3-7.0 (black curves), SSP370-lowNTCF (purple curves) and SSP5-8.5 (red curves), relative to 1995-2014, where shadings indicate model uncertainty range (1 standard deviation of the simulations).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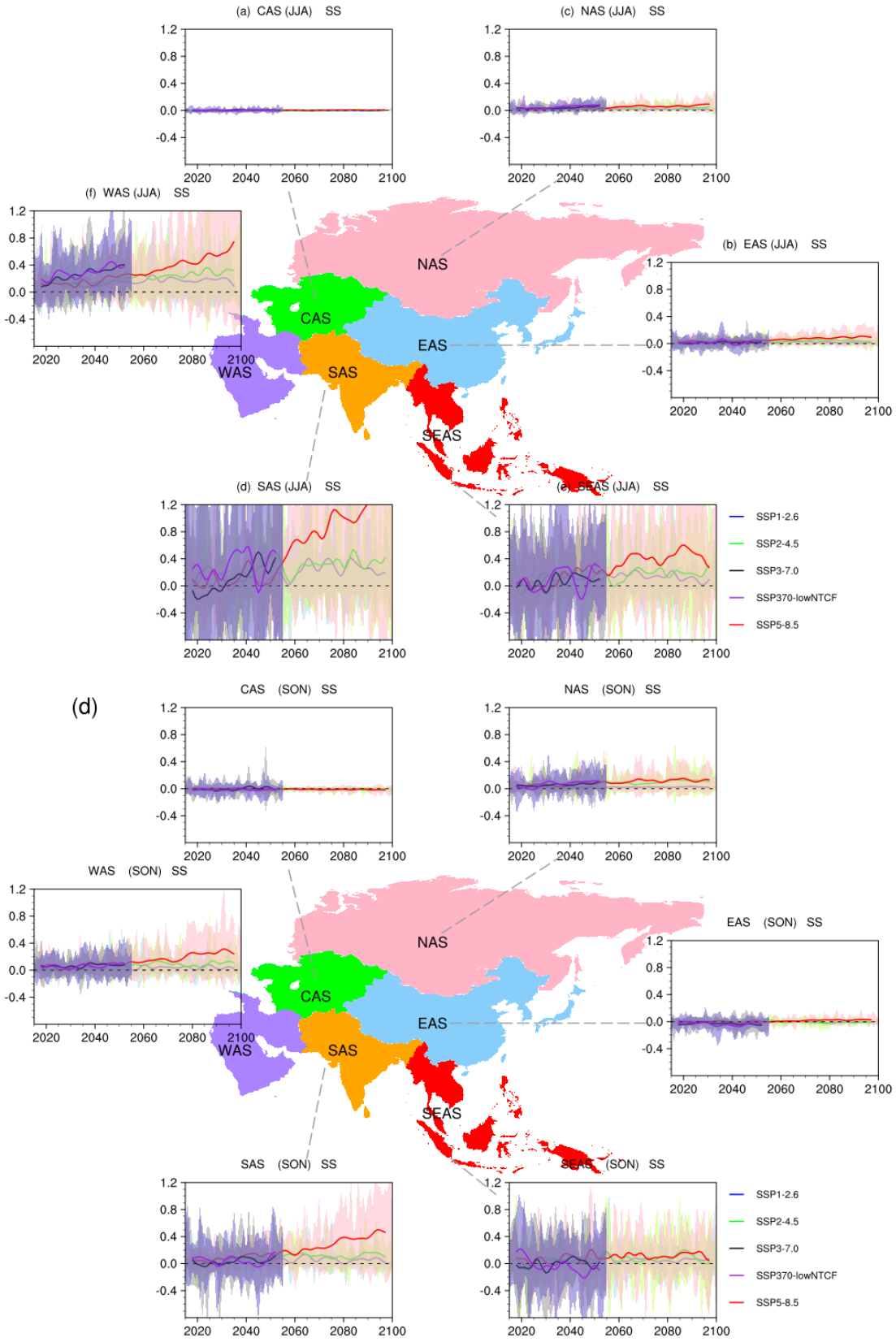
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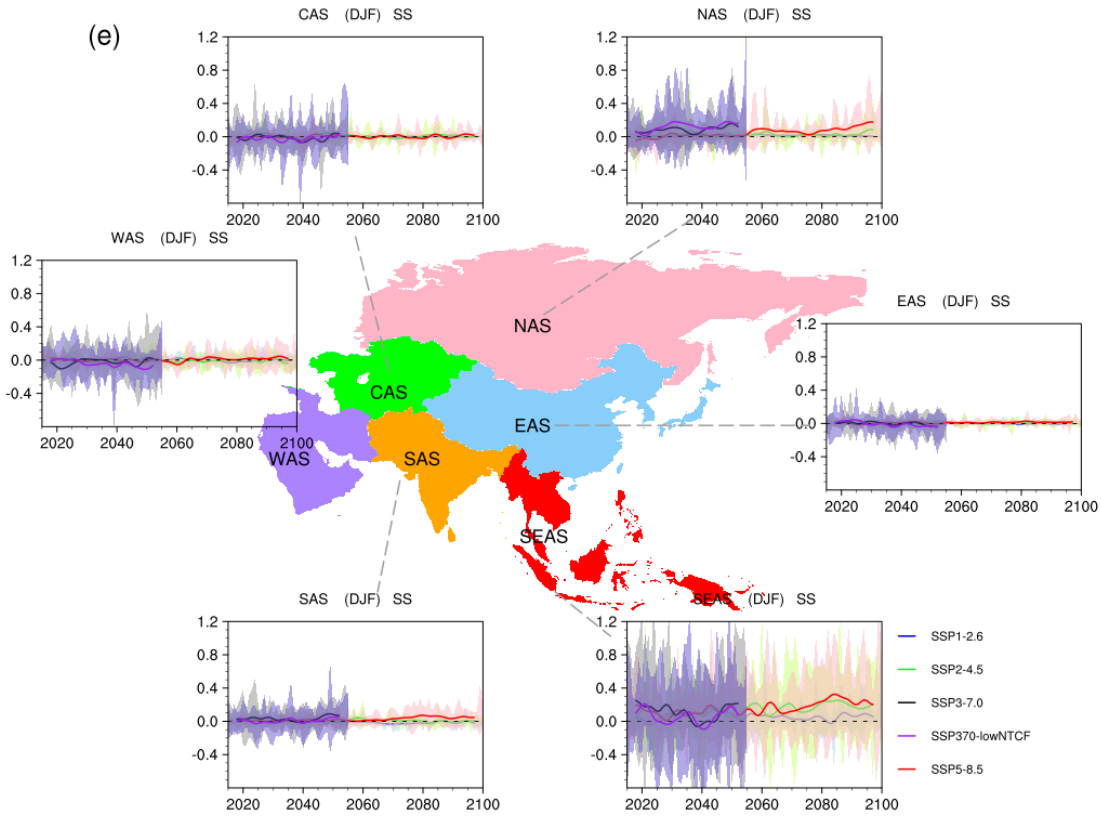
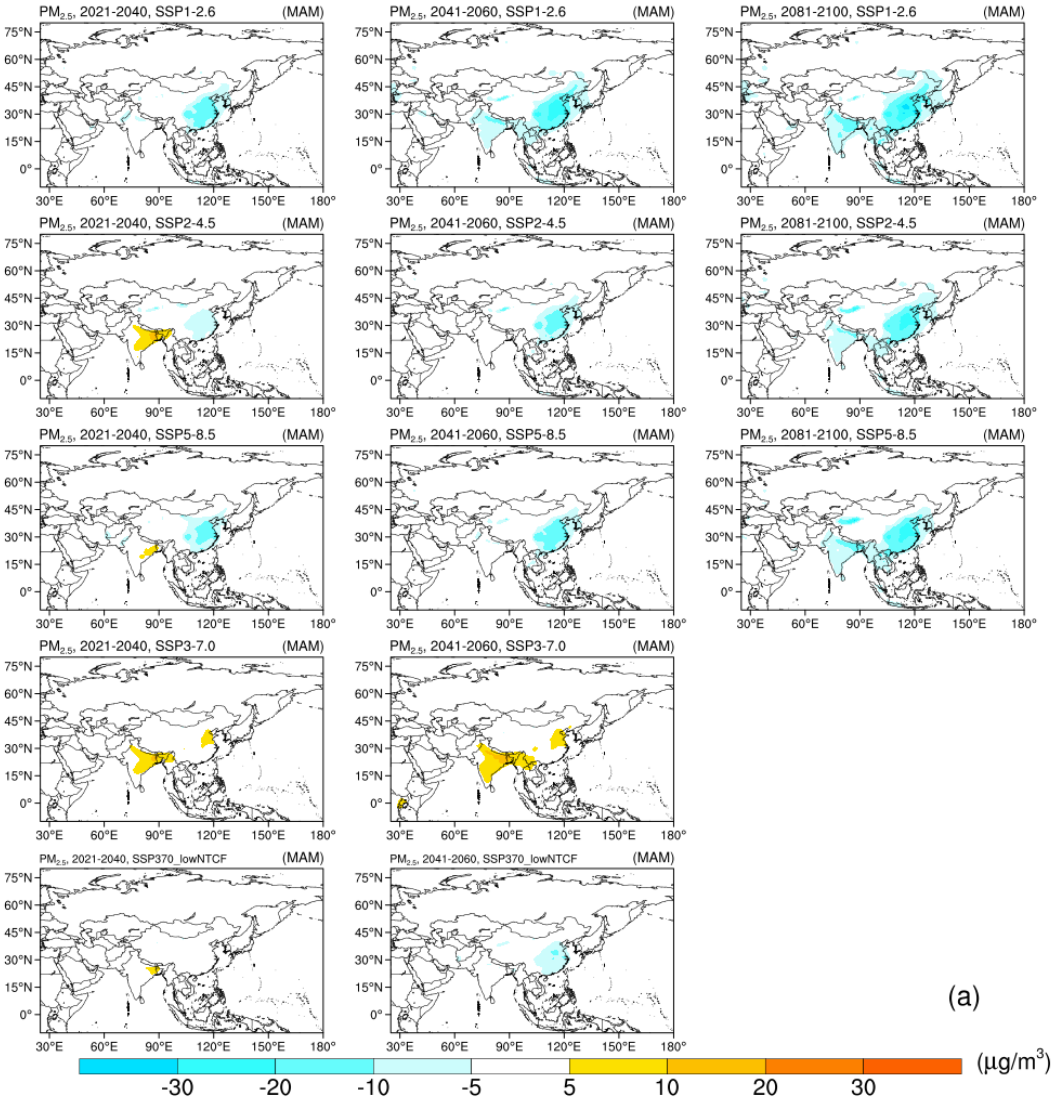


Figure S8 Time evolutions of surface sea salt (SS) concentrations (units: $\mu g/m^3$) in annual (a), spring (b), summer (c), autumn (d) and winter (e) over Asia under SSP1-2.6 (red curves), SSP2-4.5 (green curves), SSP3-7.0 (black curves), SSP370-lowNTCF (purple curves) and SSP5-8.5 (red curves), relative to 1995-2014, where shadings indicate model uncertainty range (1 standard deviation of the simulations).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75°N
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-5
5
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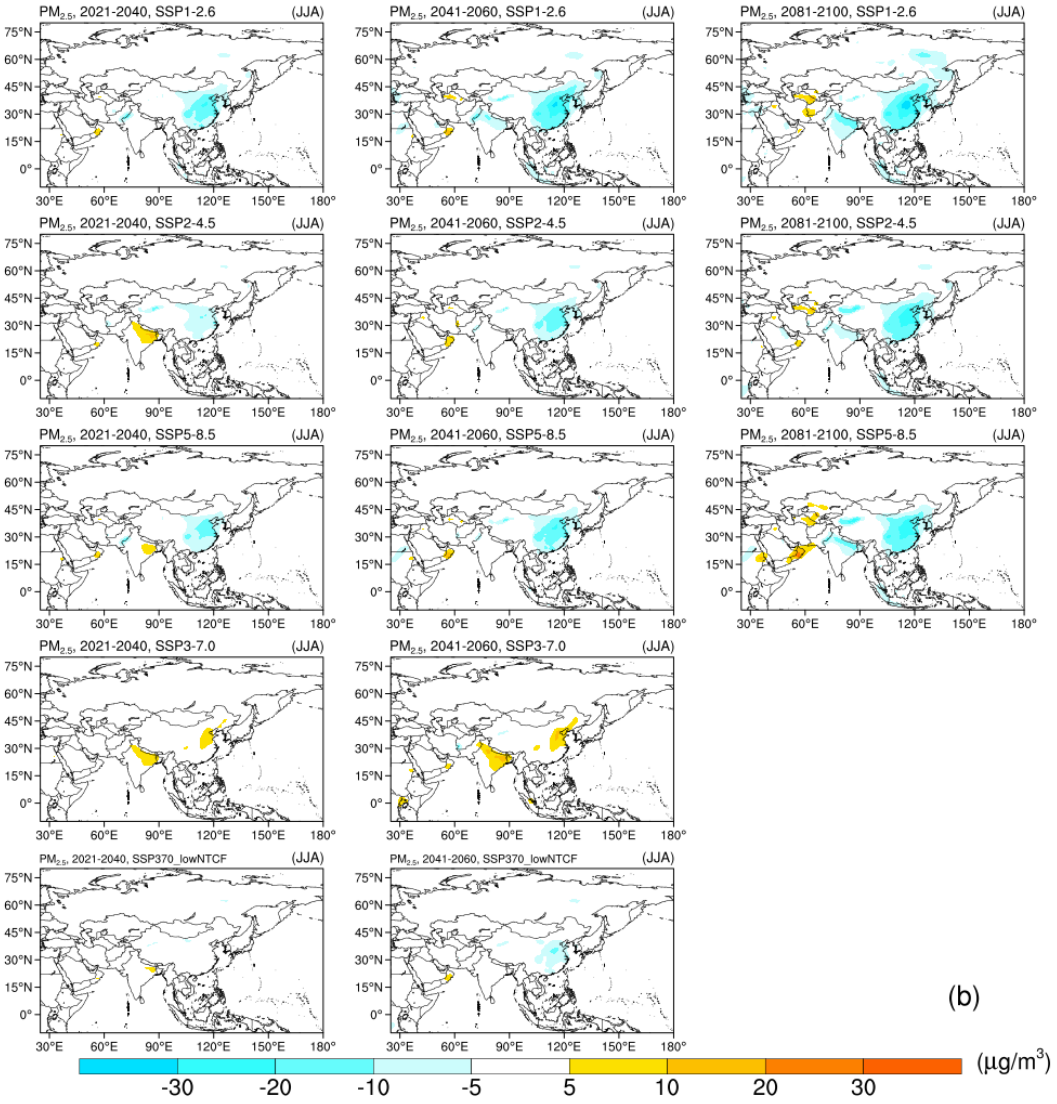
(μg/m3)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-5
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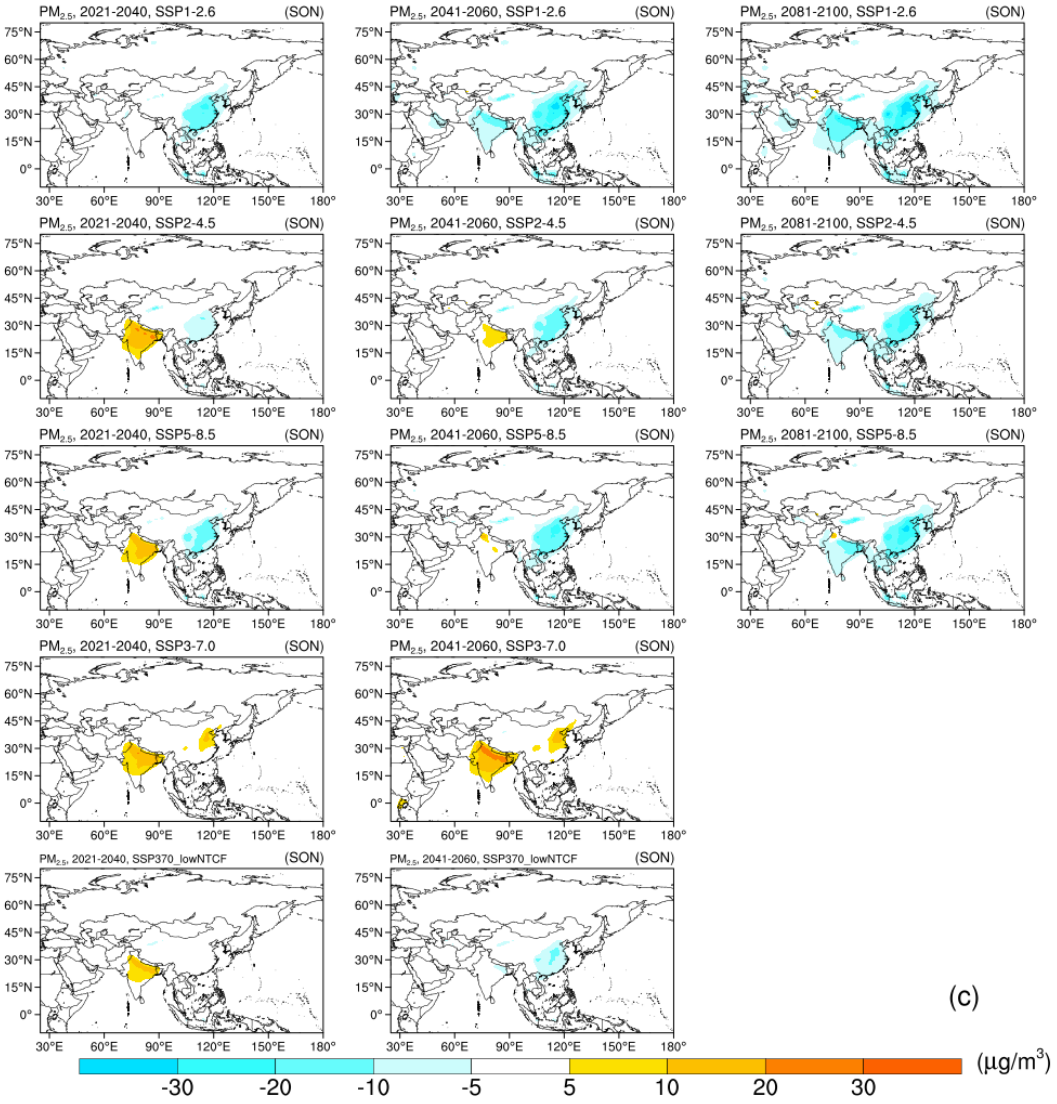
(μg/m3)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75°N
60°N
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30°E
60°E
90°E
120°E
150°E
180°
(c)
-30
-20
-10
-5
5
10
20
30
(μg/m3)

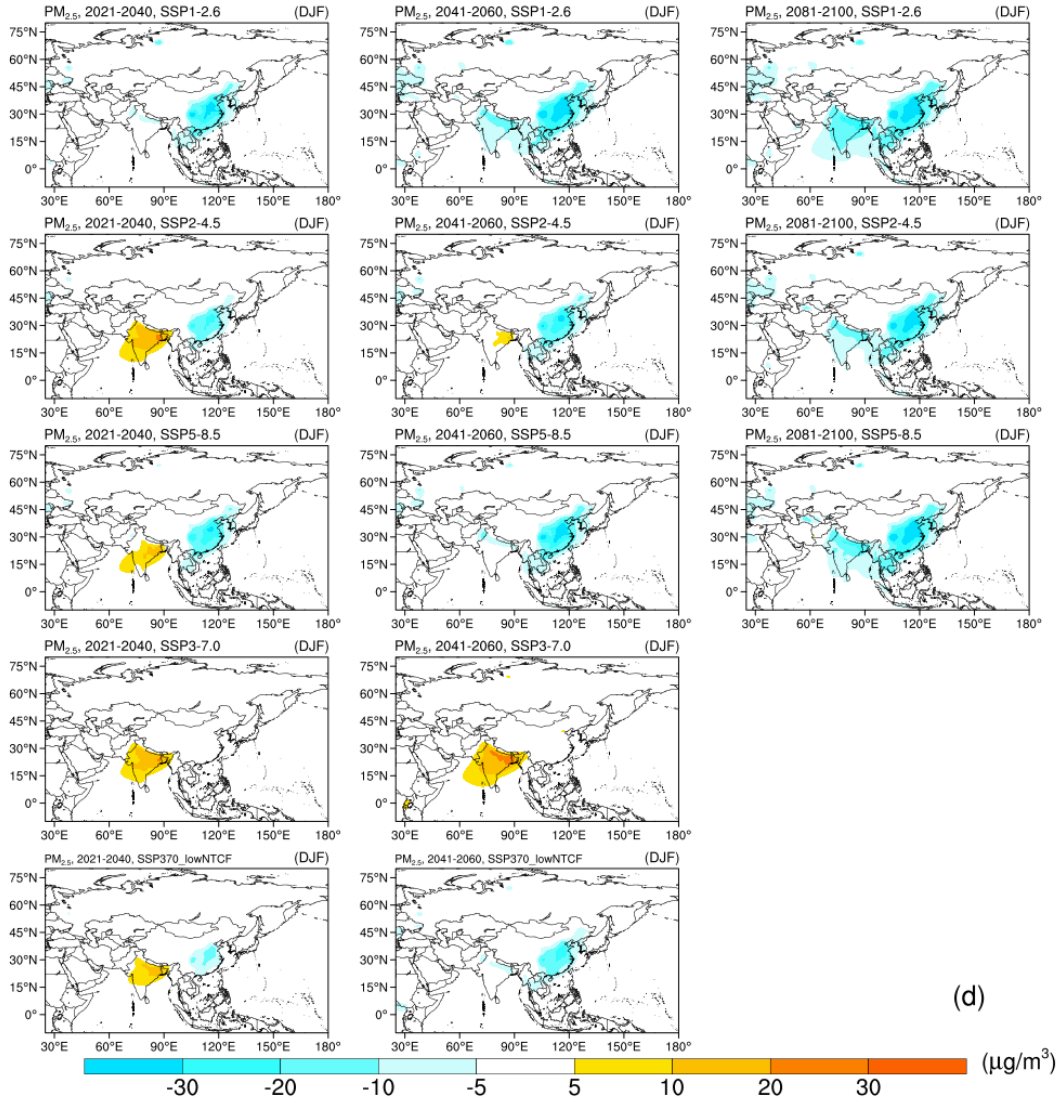
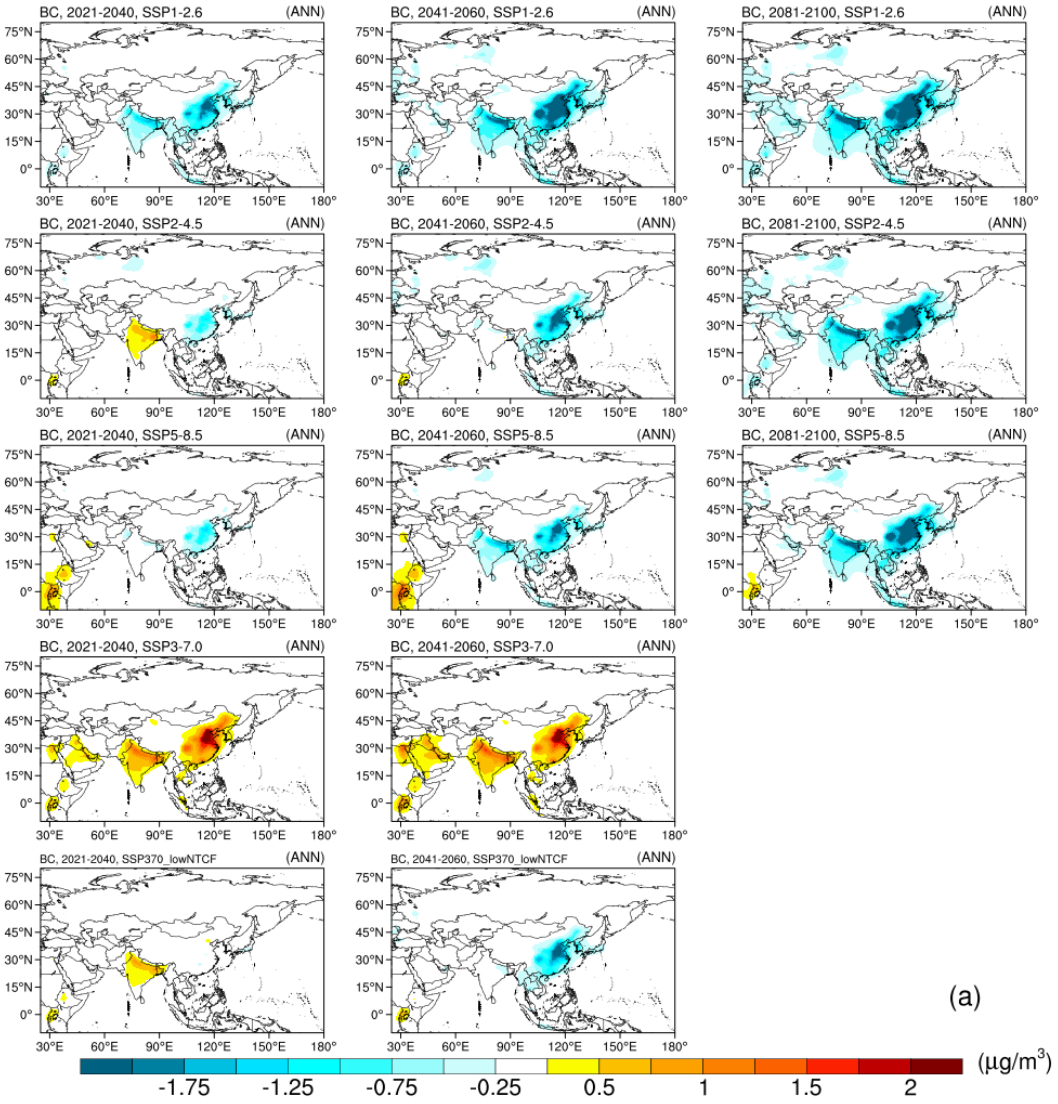
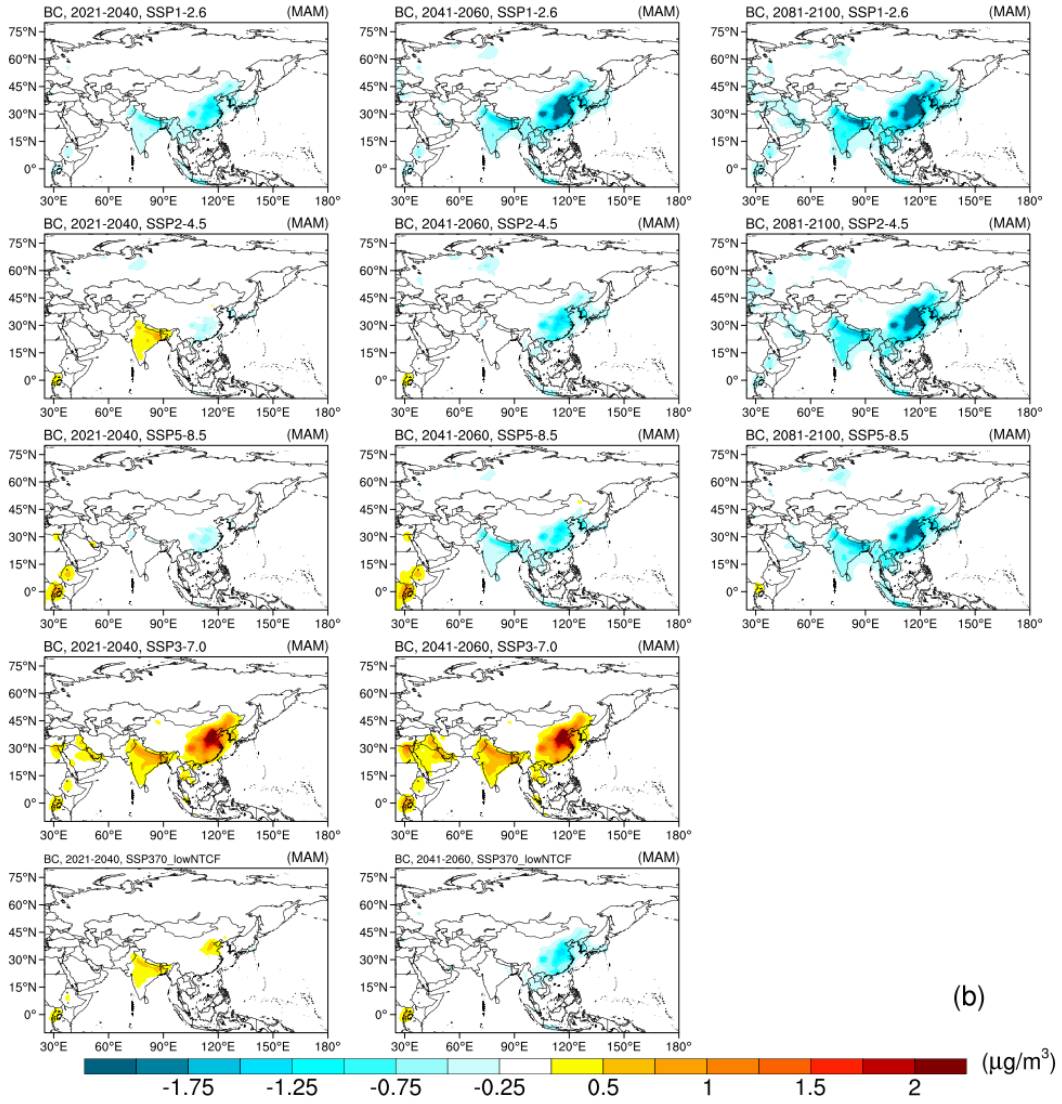
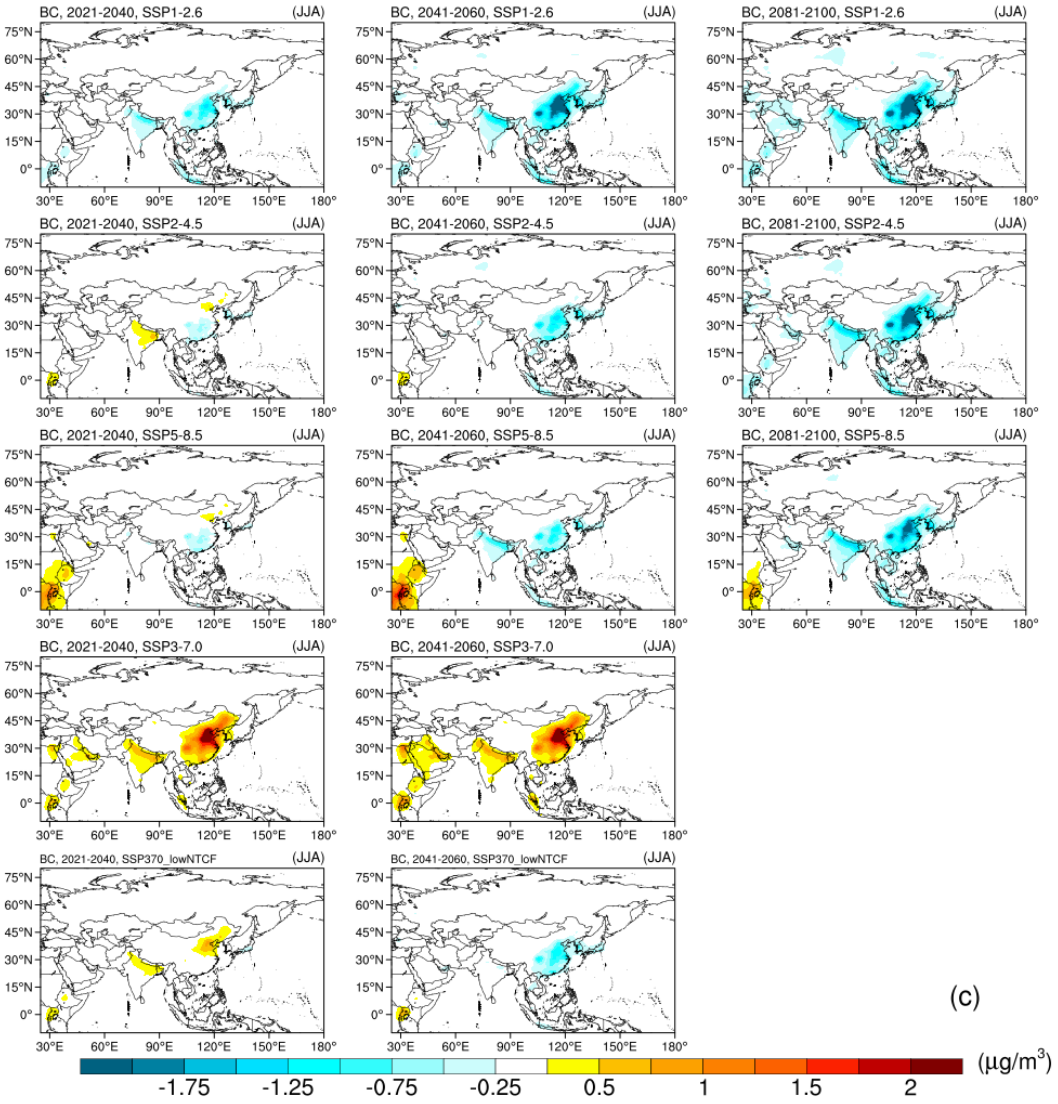


Figure S9 Spatial distribution of projected changes in surface $PM_{2.5}$ concentrations in spring (a), summer (b), autumn (c) and winter (d) (units: $\mu g/m^3$) during 2021–2040, 2041–2060 and 2081–2100 under SSPs, relative to 1995–2014.


BC, 2021-2040, SSP1-2.6 (ANN)
BC, 2041-2060, SSP1-2.6 (ANN)
BC, 2081-2100, SSP1-2.6 (ANN)
BC, 2021-2040, SSP2-4.5 (ANN)
BC, 2041-2060, SSP2-4.5 (ANN)
BC, 2081-2100, SSP2-4.5 (ANN)
BC, 2021-2040, SSP5-8.5 (ANN)
BC, 2041-2060, SSP5-8.5 (ANN)
BC, 2081-2100, SSP5-8.5 (ANN)
BC, 2021-2040, SSP3-7.0 (ANN)
BC, 2041-2060, SSP3-7.0 (ANN)
BC, 2021-2040, SSP370_lowNTCF (ANN)
BC, 2041-2060, SSP370_lowNTCF (ANN)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
(a)
-1.75
-1.25
-0.75
-0.25
0.5
1
1.5
2
(μg/m3)


BC, 2021-2040, SSP1-2.6 (MAM)
BC, 2041-2060, SSP1-2.6 (MAM)
BC, 2081-2100, SSP1-2.6 (MAM)
BC, 2021-2040, SSP2-4.5 (MAM)
BC, 2041-2060, SSP2-4.5 (MAM)
BC, 2081-2100, SSP2-4.5 (MAM)
BC, 2021-2040, SSP5-8.5 (MAM)
BC, 2041-2060, SSP5-8.5 (MAM)
BC, 2081-2100, SSP5-8.5 (MAM)
BC, 2021-2040, SSP3-7.0 (MAM)
BC, 2041-2060, SSP3-7.0 (MAM)
BC, 2021-2040, SSP370_lowNTCF (MAM)
BC, 2041-2060, SSP370_lowNTCF (MAM)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
(b)
-1.75
-1.25
-0.75
-0.25
0.5
1
1.5
2
(μg/m3)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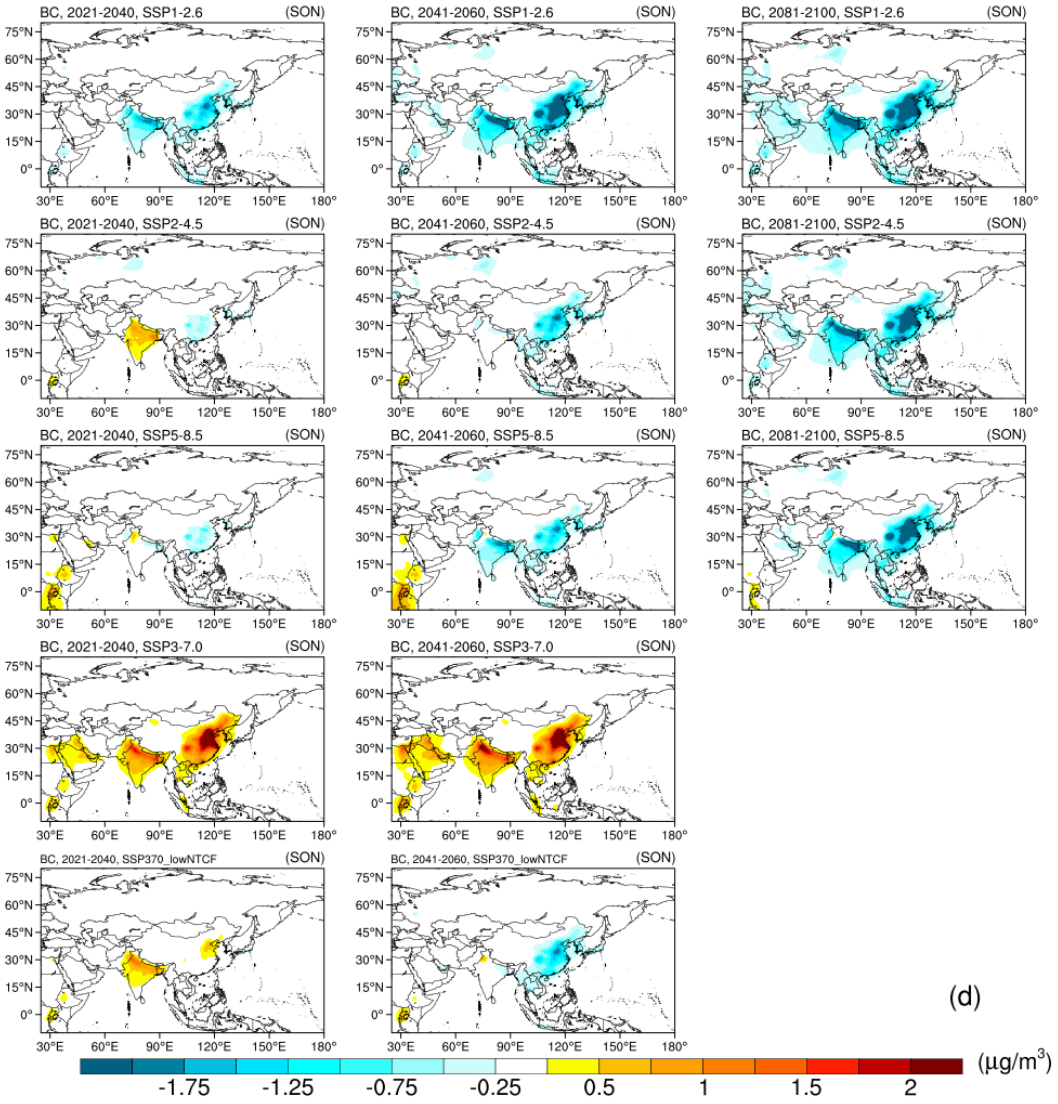
BC, 2041-2060, SSP1-2.6 (JJA)
BC, 2081-2100, SSP1-2.6 (JJA)
BC, 2021-2040, SSP2-4.5 (JJA)
BC, 2041-2060, SSP2-4.5 (JJA)
BC, 2081-2100, SSP2-4.5 (JJA)
BC, 2021-2040, SSP5-8.5 (JJA)
BC, 2041-2060, SSP5-8.5 (JJA)
BC, 2081-2100, SSP5-8.5 (JJA)
BC, 2021-2040, SSP3-7.0 (JJA)
BC, 2041-2060, SSP3-7.0 (JJA)
BC, 2021-2040, SSP370_lowNTCF (JJA)
BC, 2041-2060, SSP370_lowNTCF (JJA)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
(c)
(μg/m3)
-1.75
-1.25
-0.75
-0.25
0.5
1
1.5
2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BC, 2081-2100, SSP1-2.6 (SON)
BC, 2021-2040, SSP2-4.5 (SON)
BC, 2041-2060, SSP2-4.5 (SON)
BC, 2081-2100, SSP2-4.5 (SON)
BC, 2021-2040, SSP5-8.5 (SON)
BC, 2041-2060, SSP5-8.5 (SON)
BC, 2081-2100, SSP5-8.5 (SON)
BC, 2021-2040, SSP3-7.0 (SON)
BC, 2041-2060, SSP3-7.0 (SON)
BC, 2021-2040, SSP370_lowNTCF (SON)
BC, 2041-2060, SSP370_lowNTCF (SON)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
(d)
(μg/m3)
-1.75
-1.25
-0.75
-0.25
0.5
1
1.5
2

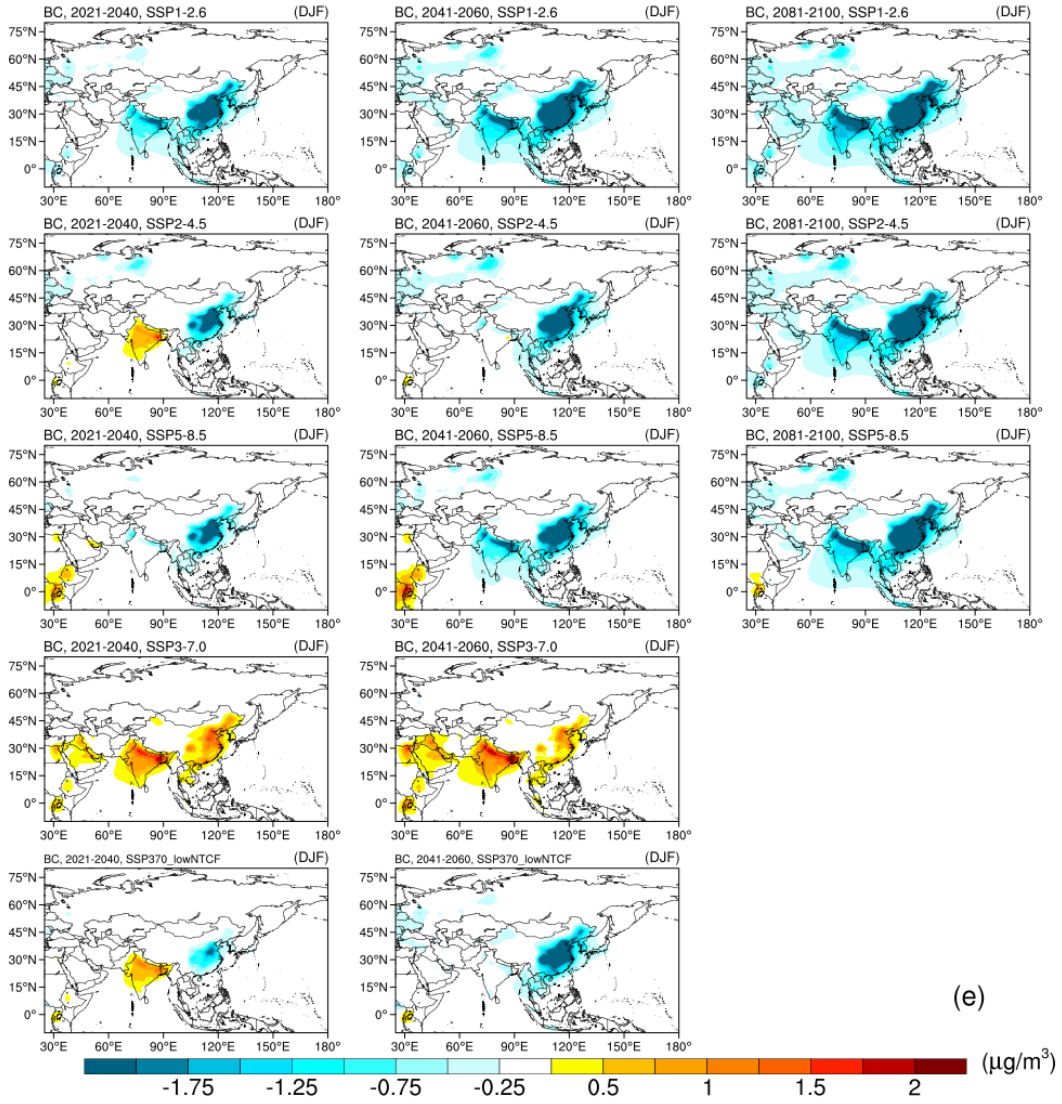
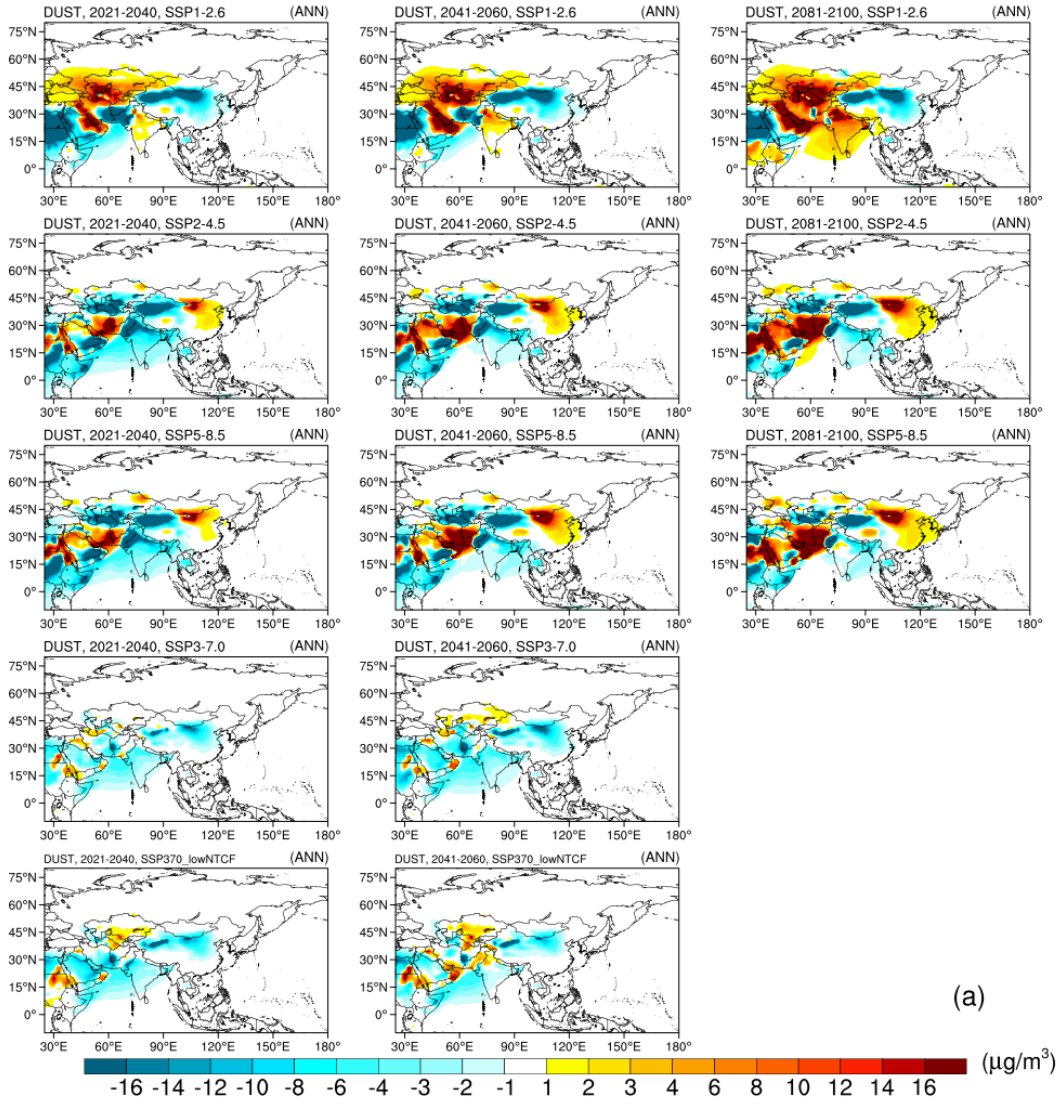
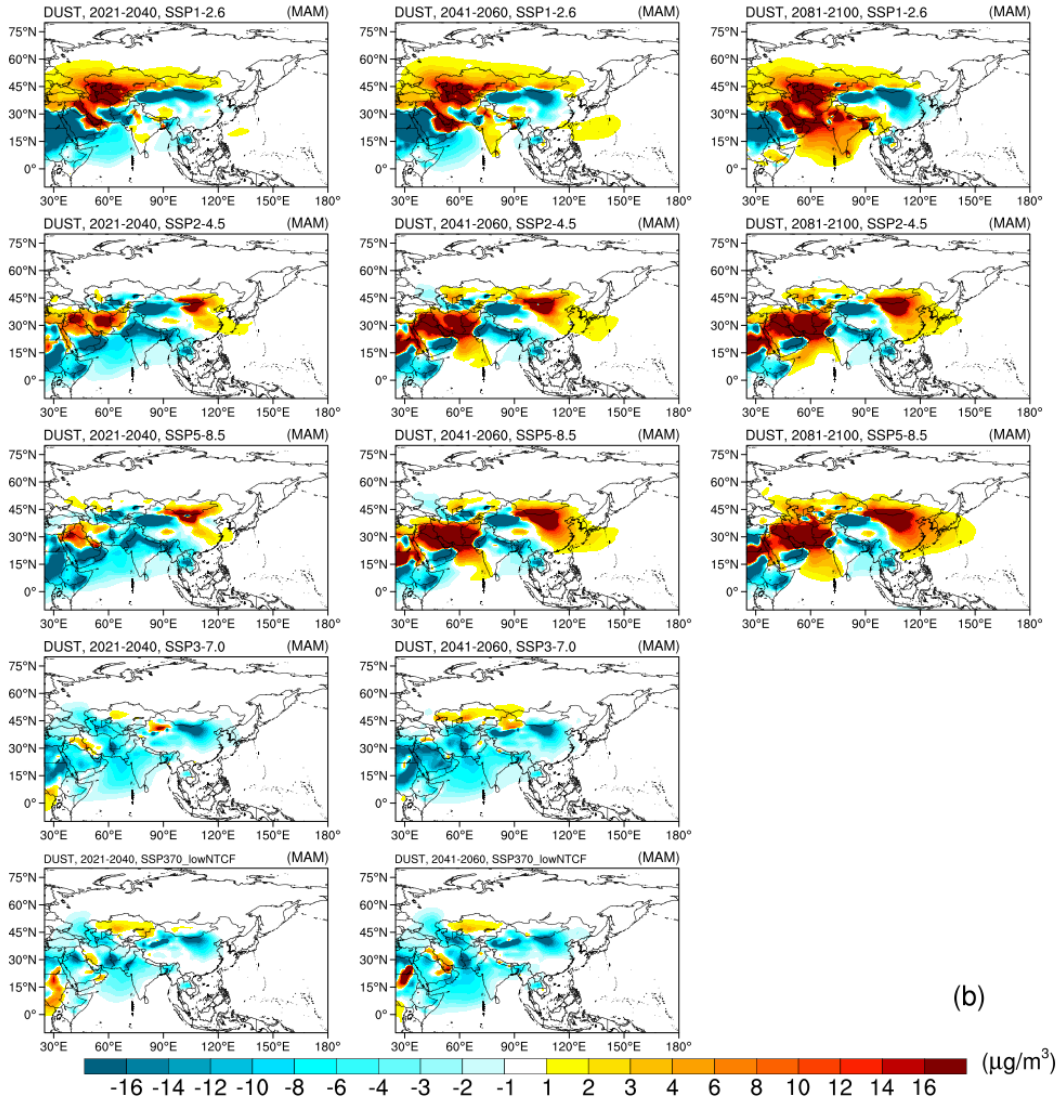


Figure S10 Spatial distribution of projected changes in surface BC concentrations in annual (a), spring (b), summer (c), autumn (d) and winter (e) (units: $\mu g/m^3$) during 2021–2040, 2041–2060 and 2081–2100 under SSPs, relative to 1995–2014.


DUST, 2021-2040, SSP1-2.6 (ANN)
DUST, 2041-2060, SSP1-2.6 (ANN)
DUST, 2081-2100, SSP1-2.6 (ANN)
DUST, 2021-2040, SSP2-4.5 (ANN)
DUST, 2041-2060, SSP2-4.5 (ANN)
DUST, 2081-2100, SSP2-4.5 (ANN)
DUST, 2021-2040, SSP5-8.5 (ANN)
DUST, 2041-2060, SSP5-8.5 (ANN)
DUST, 2081-2100, SSP5-8.5 (ANN)
DUST, 2021-2040, SSP3-7.0 (ANN)
DUST, 2041-2060, SSP3-7.0 (ANN)
DUST, 2021-2040, SSP370_lowNTCF (ANN)
DUST, 2041-2060, SSP370_lowNTCF (ANN)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
-16 -14 -12 -10 -8 -6 -4 -3 -2 -1 1 2 3 4 6 8 10 12 14 16
(μg/m3)
(a)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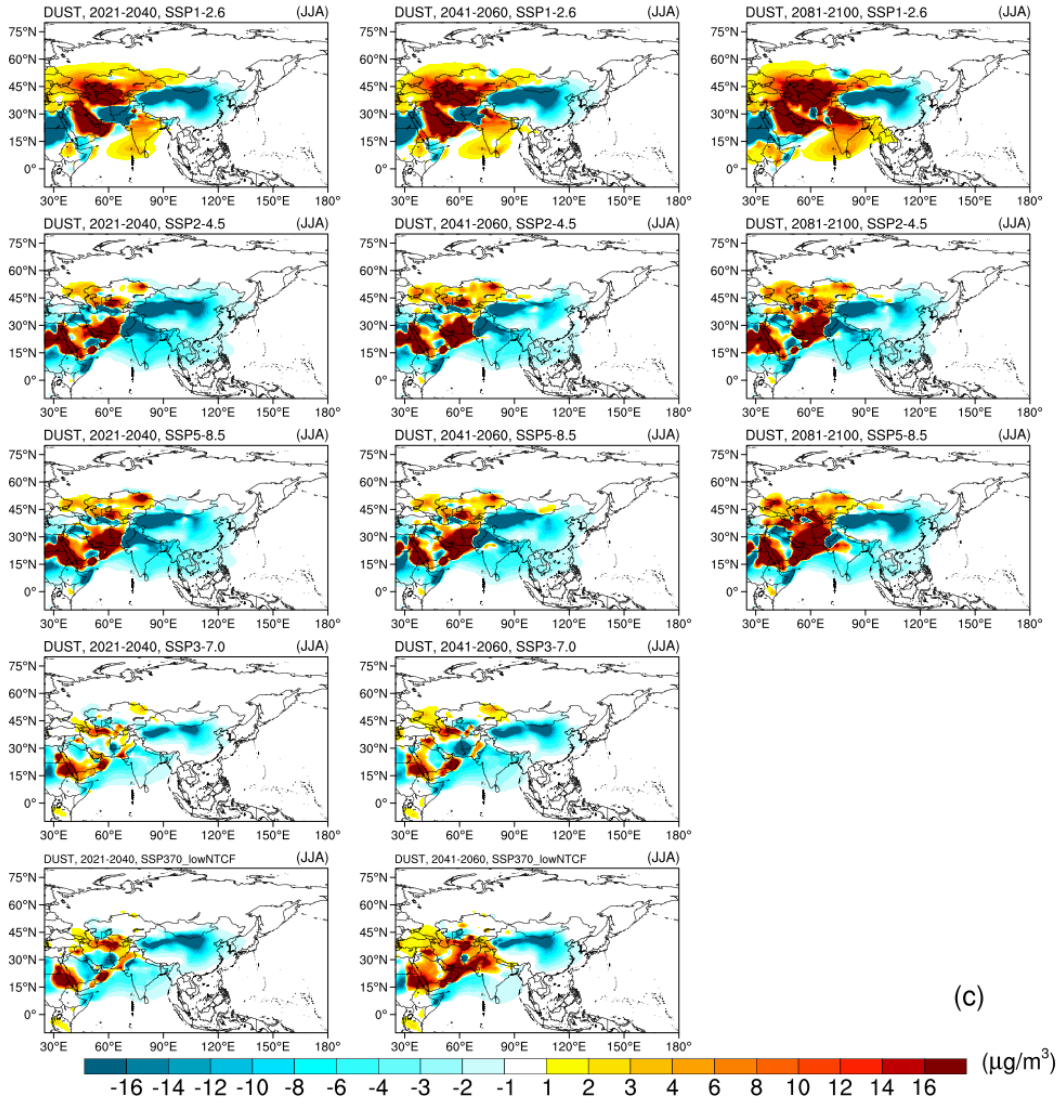
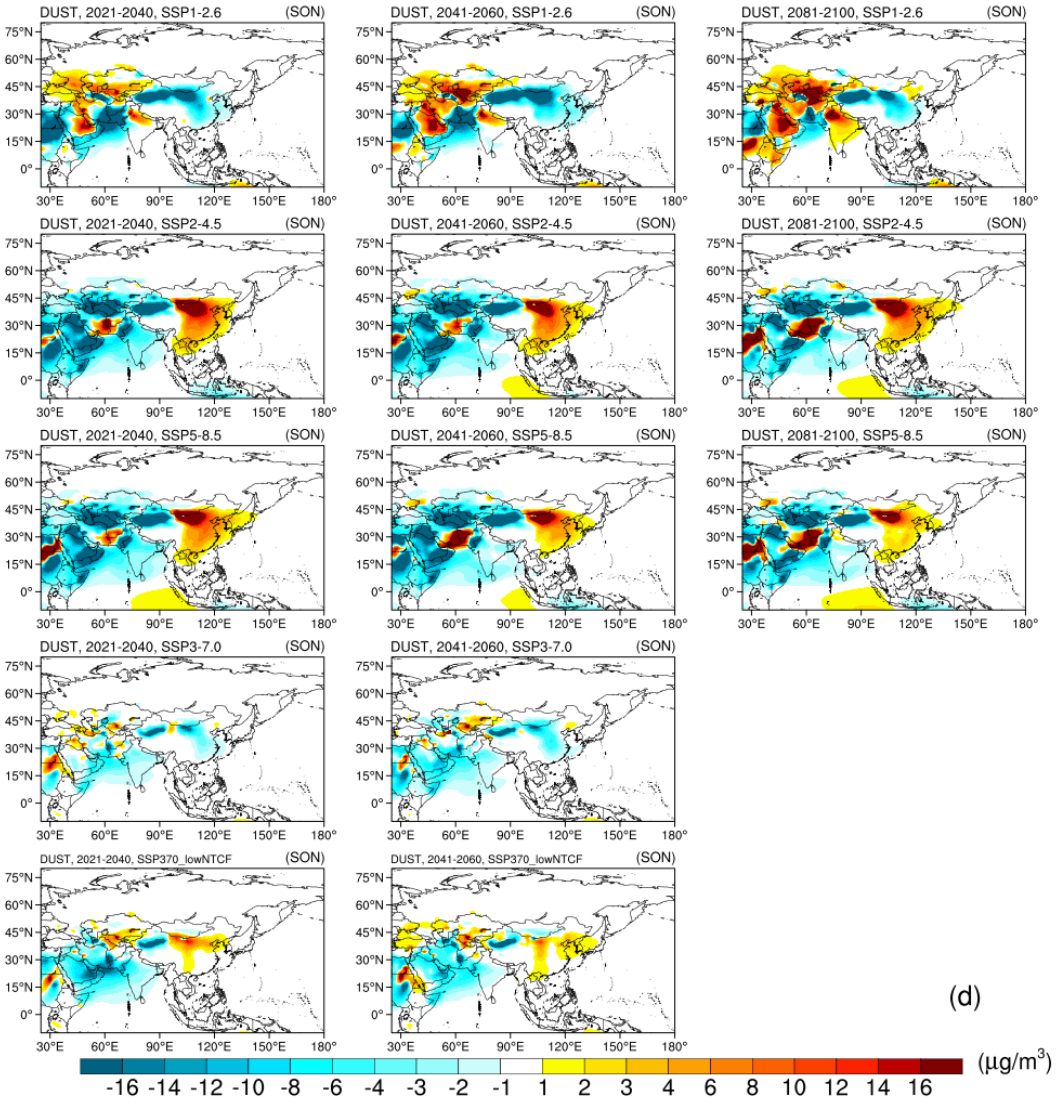
DUST, 2041-2060, SSP1-2.6 (MAM)
DUST, 2081-2100, SSP1-2.6 (MAM)
DUST, 2021-2040, SSP2-4.5 (MAM)
DUST, 2041-2060, SSP2-4.5 (MAM)
DUST, 2081-2100, SSP2-4.5 (MAM)
DUST, 2021-2040, SSP5-8.5 (MAM)
DUST, 2041-2060, SSP5-8.5 (MAM)
DUST, 2081-2100, SSP5-8.5 (MAM)
DUST, 2021-2040, SSP3-7.0 (MAM)
DUST, 2041-2060, SSP3-7.0 (MAM)
DUST, 2021-2040, SSP370_lowNTCF (MAM)
DUST, 2041-2060, SSP370_lowNTCF (MAM)
75°N
60°N
45°N
30°N
15°N
0°
30°E 60°E 90°E 120°E 150°E 180°
(b)
-16 -14 -12 -10 -8 -6 -4 -3 -2 -1 1 2 3 4 6 8 10 12 14 16
(μg/m3)


DUST, 2021-2040, SSP1-2.6 (JJA)
DUST, 2041-2060, SSP1-2.6 (JJA)
DUST, 2081-2100, SSP1-2.6 (JJA)
DUST, 2021-2040, SSP2-4.5 (JJA)
DUST, 2041-2060, SSP2-4.5 (JJA)
DUST, 2081-2100, SSP2-4.5 (JJA)
DUST, 2021-2040, SSP5-8.5 (JJA)
DUST, 2041-2060, SSP5-8.5 (JJA)
DUST, 2081-2100, SSP5-8.5 (JJA)
DUST, 2021-2040, SSP3-7.0 (JJA)
DUST, 2041-2060, SSP3-7.0 (JJA)
DUST, 2021-2040, SSP370_lowNTCF (JJA)
DUST, 2041-2060, SSP370_lowNTCF (JJA)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
(c)
-16 -14 -12 -10 -8 -6 -4 -3 -2 -1 1 2 3 4 6 8 10 12 14 16
(μg/m3)


DUST, 2021-2040, SSP1-2.6 (SON)
DUST, 2041-2060, SSP1-2.6 (SON)
DUST, 2081-2100, SSP1-2.6 (SON)
DUST, 2021-2040, SSP2-4.5 (SON)
DUST, 2041-2060, SSP2-4.5 (SON)
DUST, 2081-2100, SSP2-4.5 (SON)
DUST, 2021-2040, SSP5-8.5 (SON)
DUST, 2041-2060, SSP5-8.5 (SON)
DUST, 2081-2100, SSP5-8.5 (SON)
DUST, 2021-2040, SSP3-7.0 (SON)
DUST, 2041-2060, SSP3-7.0 (SON)
DUST, 2021-2040, SSP370_lowNTCF (SON)
DUST, 2041-2060, SSP370_lowNTCF (SON)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
(d)
-16 -14 -12 -10 -8 -6 -4 -3 -2 -1 1 2 3 4 6 8 10 12 14 16
(μg/m3)

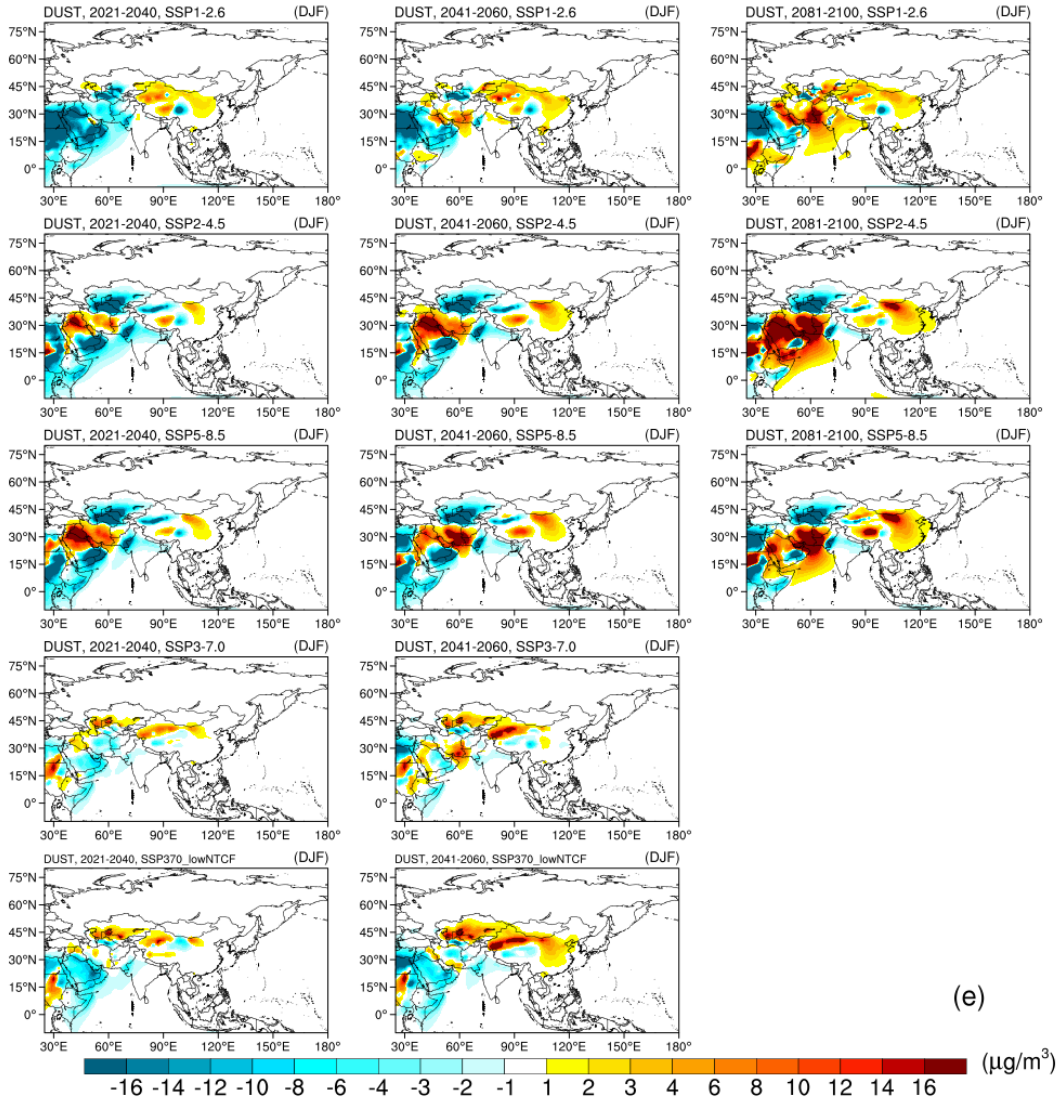
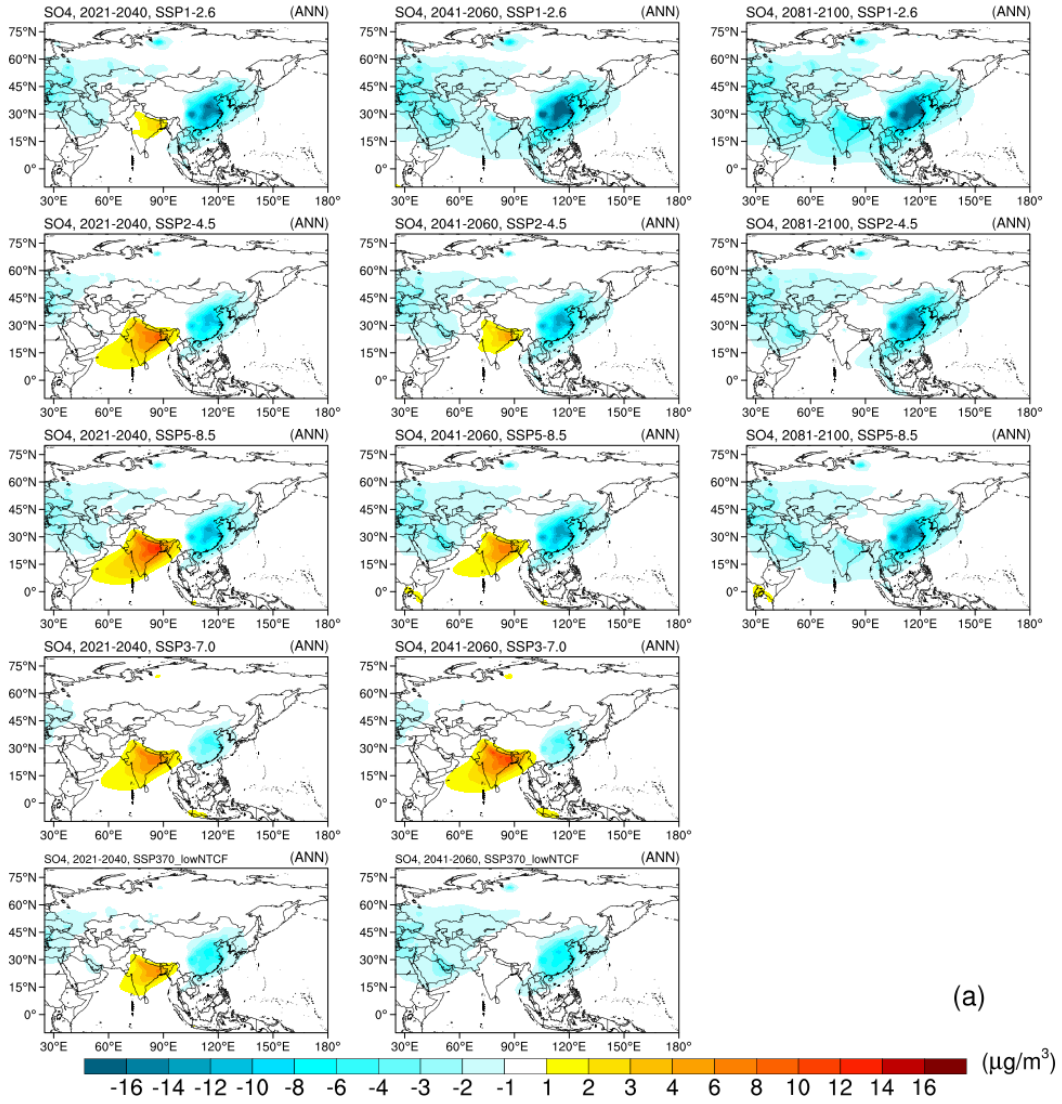
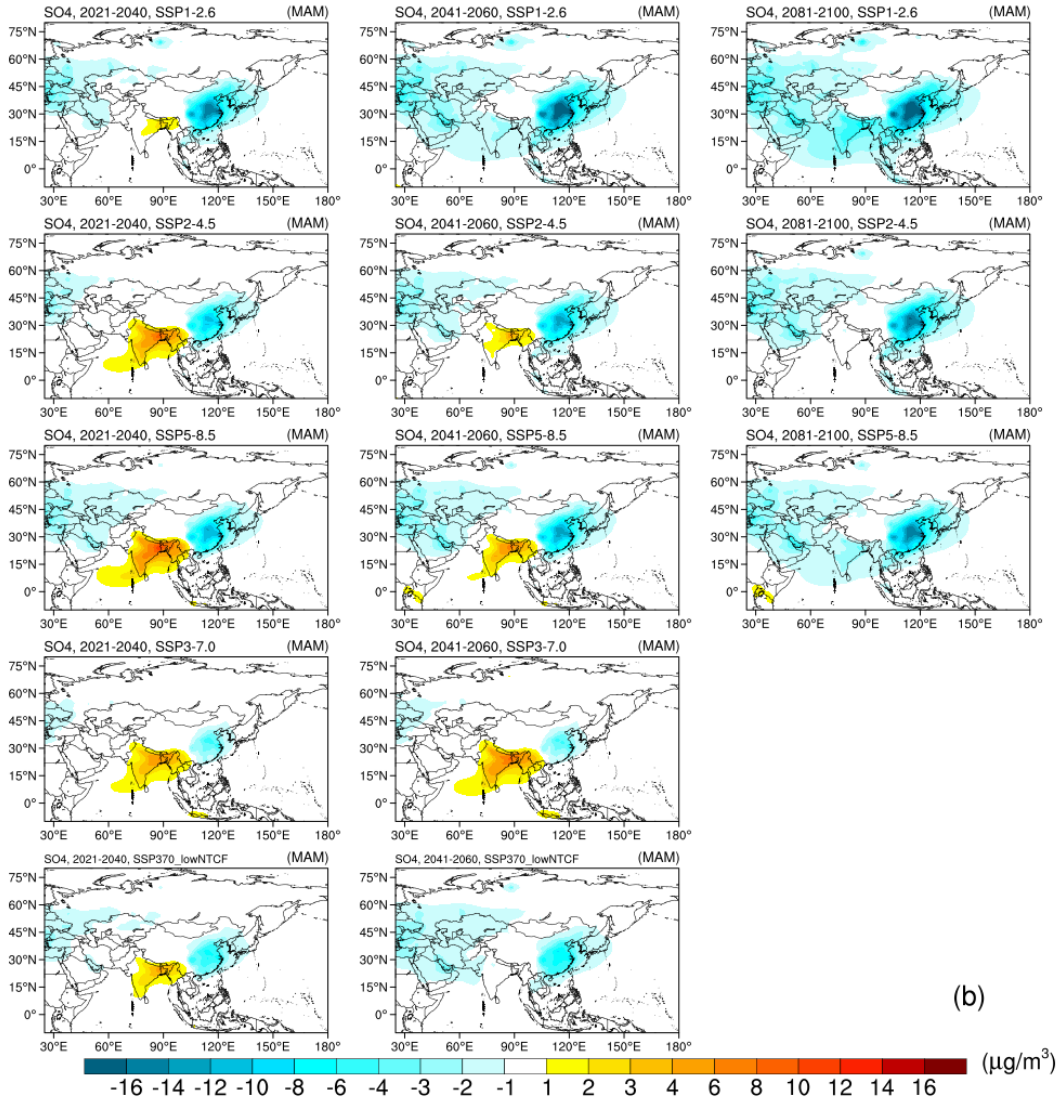


Figure S11 Spatial distribution of projected changes in surface dust concentrations in annual (a), spring (b), summer (c), autumn (d) and winter (e) (units: $\mu g/m^3$) during 2021–2040, 2041–2060 and 2081–2100 under SSPs, relative to 1995–2014.


SO4, 2021-2040, SSP1-2.6 (ANN)
SO4, 2041-2060, SSP1-2.6 (ANN)
SO4, 2081-2100, SSP1-2.6 (ANN)
SO4, 2021-2040, SSP2-4.5 (ANN)
SO4, 2041-2060, SSP2-4.5 (ANN)
SO4, 2081-2100, SSP2-4.5 (ANN)
SO4, 2021-2040, SSP5-8.5 (ANN)
SO4, 2041-2060, SSP5-8.5 (ANN)
SO4, 2081-2100, SSP5-8.5 (ANN)
SO4, 2021-2040, SSP3-7.0 (ANN)
SO4, 2041-2060, SSP3-7.0 (ANN)
SO4, 2021-2040, SSP370_lowNTCF (ANN)
SO4, 2041-2060, SSP370_lowNTCF (ANN)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
(a)
-16 -14 -12 -10 -8 -6 -4 -3 -2 -1 1 2 3 4 6 8 10 12 14 16
(μg/m3)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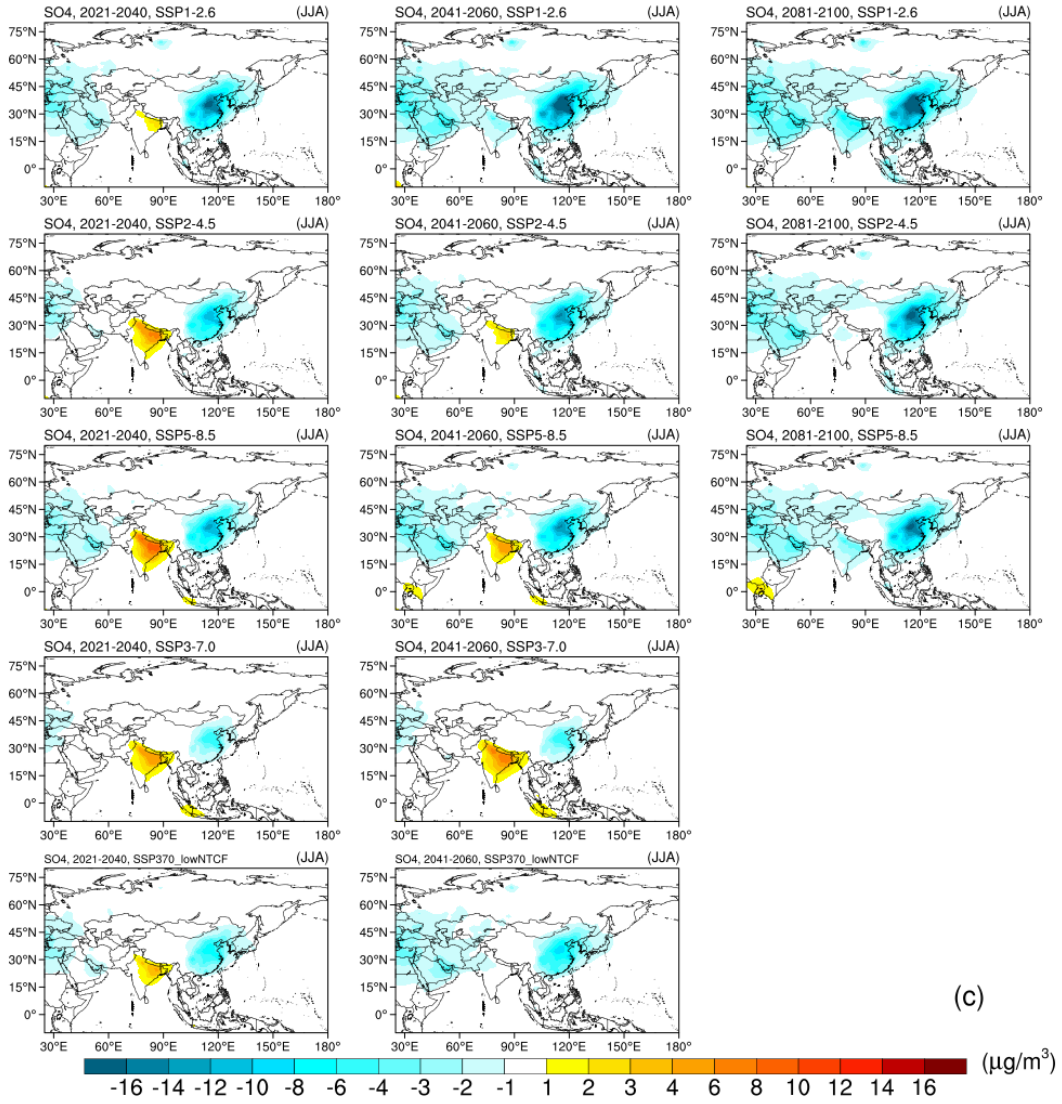
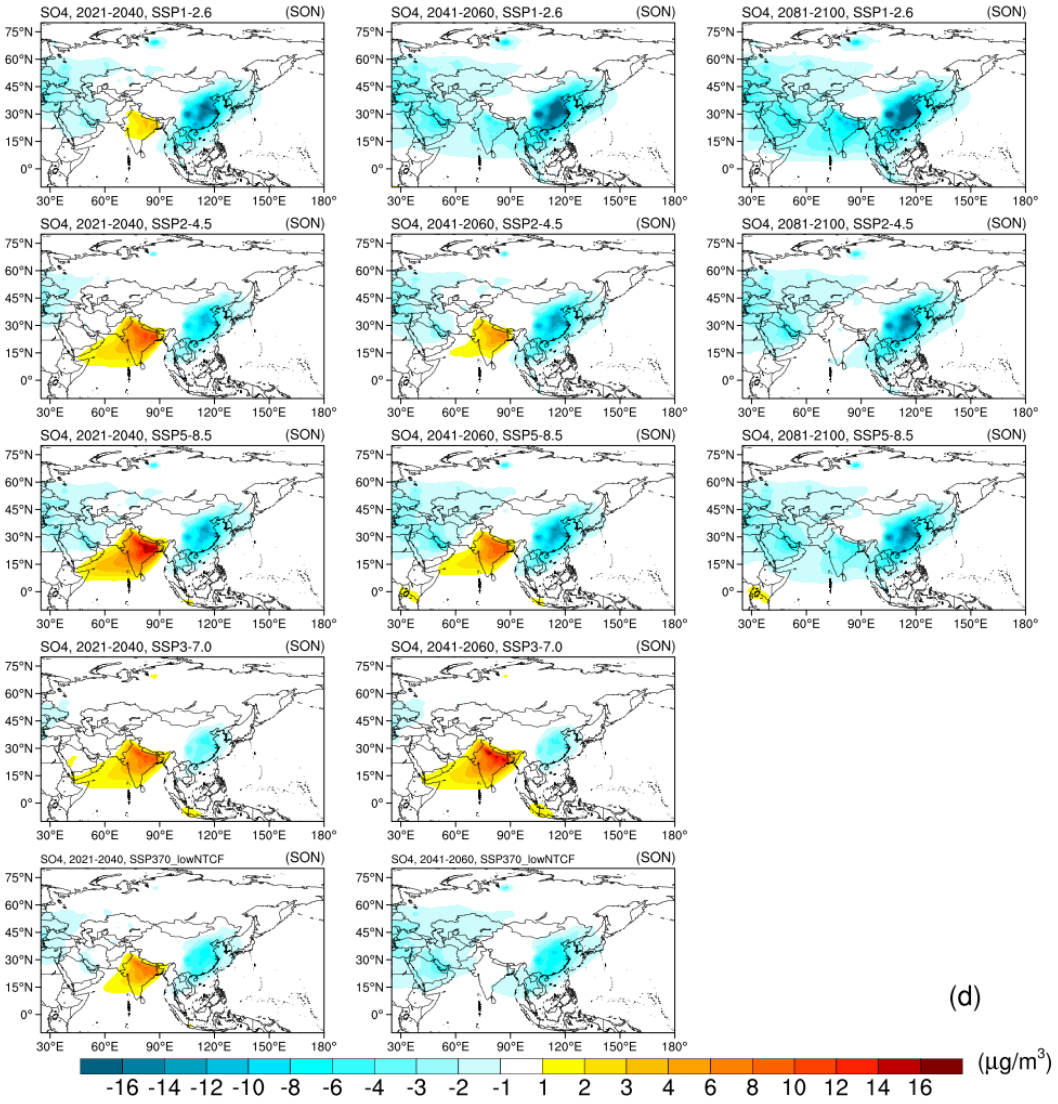
SO4, 2041-2060, SSP1-2.6 (MAM)
SO4, 2081-2100, SSP1-2.6 (MAM)
SO4, 2021-2040, SSP2-4.5 (MAM)
SO4, 2041-2060, SSP2-4.5 (MAM)
SO4, 2081-2100, SSP2-4.5 (MAM)
SO4, 2021-2040, SSP5-8.5 (MAM)
SO4, 2041-2060, SSP5-8.5 (MAM)
SO4, 2081-2100, SSP5-8.5 (MAM)
SO4, 2021-2040, SSP3-7.0 (MAM)
SO4, 2041-2060, SSP3-7.0 (MAM)
SO4, 2021-2040, SSP370_lowNTCF (MAM)
SO4, 2041-2060, SSP370_lowNTCF (MAM)
75°N
60°N
45°N
30°N
15°N
0°
30°E 60°E 90°E 120°E 150°E 180°
(b)
-16 -14 -12 -10 -8 -6 -4 -3 -2 -1 1 2 3 4 6 8 10 12 14 16
(μg/m3)


SO4, 2021-2040, SSP1-2.6 (JJA)
SO4, 2041-2060, SSP1-2.6 (JJA)
SO4, 2081-2100, SSP1-2.6 (JJA)
SO4, 2021-2040, SSP2-4.5 (JJA)
SO4, 2041-2060, SSP2-4.5 (JJA)
SO4, 2081-2100, SSP2-4.5 (JJA)
SO4, 2021-2040, SSP5-8.5 (JJA)
SO4, 2041-2060, SSP5-8.5 (JJA)
SO4, 2081-2100, SSP5-8.5 (JJA)
SO4, 2021-2040, SSP3-7.0 (JJA)
SO4, 2041-2060, SSP3-7.0 (JJA)
SO4, 2021-2040, SSP370_lowNTCF (JJA)
SO4, 2041-2060, SSP370_lowNTCF (JJA)
75°N
60°N
45°N
30°N
15°N
0°
30°E 60°E 90°E 120°E 150°E 180°
(c)
-16 -14 -12 -10 -8 -6 -4 -3 -2 -1 1 2 3 4 6 8 10 12 14 16
(μg/m3)


SO4, 2021-2040, SSP1-2.6 (SON)
SO4, 2041-2060, SSP1-2.6 (SON)
SO4, 2081-2100, SSP1-2.6 (SON)
SO4, 2021-2040, SSP2-4.5 (SON)
SO4, 2041-2060, SSP2-4.5 (SON)
SO4, 2081-2100, SSP2-4.5 (SON)
SO4, 2021-2040, SSP5-8.5 (SON)
SO4, 2041-2060, SSP5-8.5 (SON)
SO4, 2081-2100, SSP5-8.5 (SON)
SO4, 2021-2040, SSP3-7.0 (SON)
SO4, 2041-2060, SSP3-7.0 (SON)
SO4, 2021-2040, SSP370_lowNTCF (SON)
SO4, 2041-2060, SSP370_lowNTCF (SON)
75°N 60°N 45°N 30°N 15°N 0°
30°E 60°E 90°E 120°E 150°E 180°
(d)
-16 -14 -12 -10 -8 -6 -4 -3 -2 -1 1 2 3 4 6 8 10 12 14 16
(μg/m3)

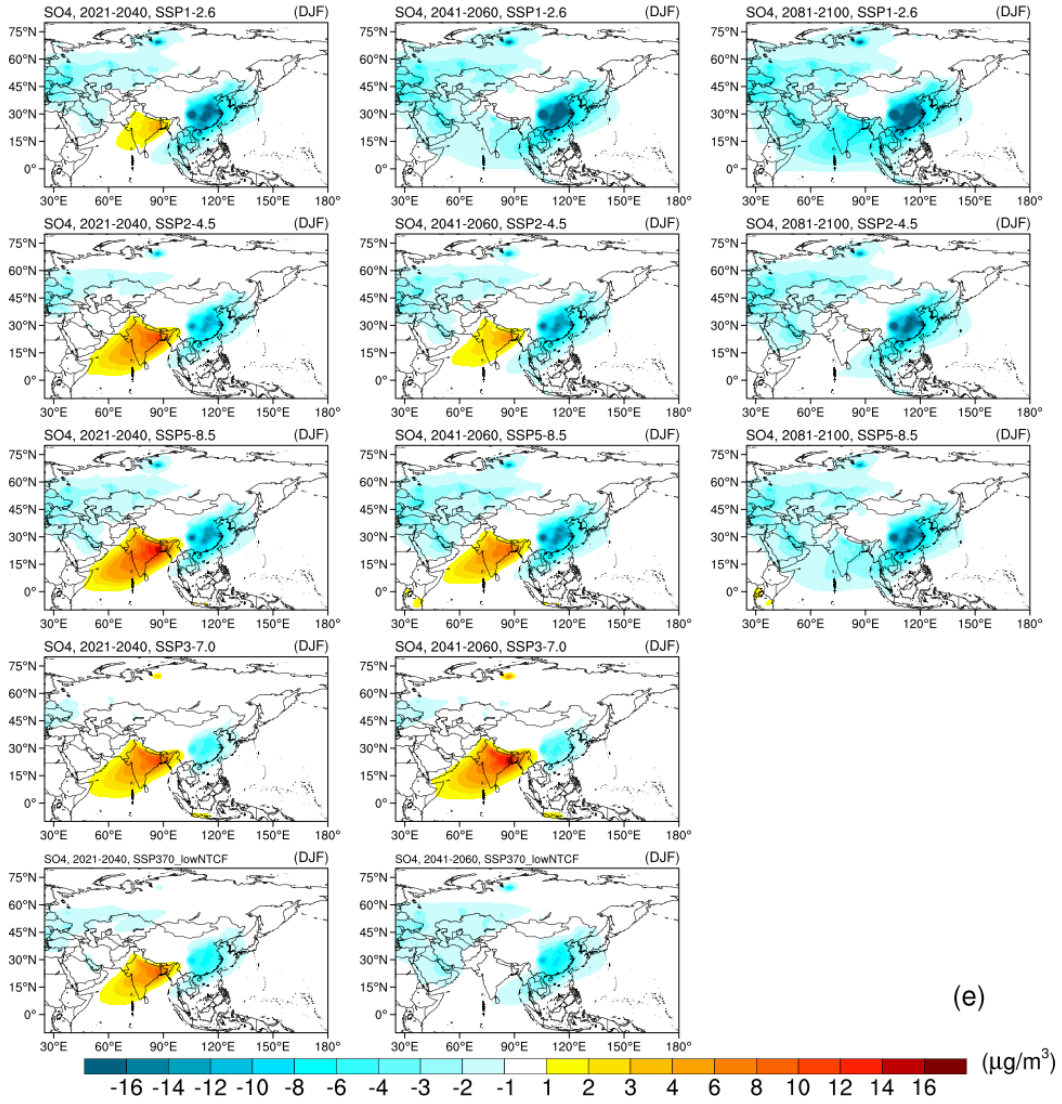
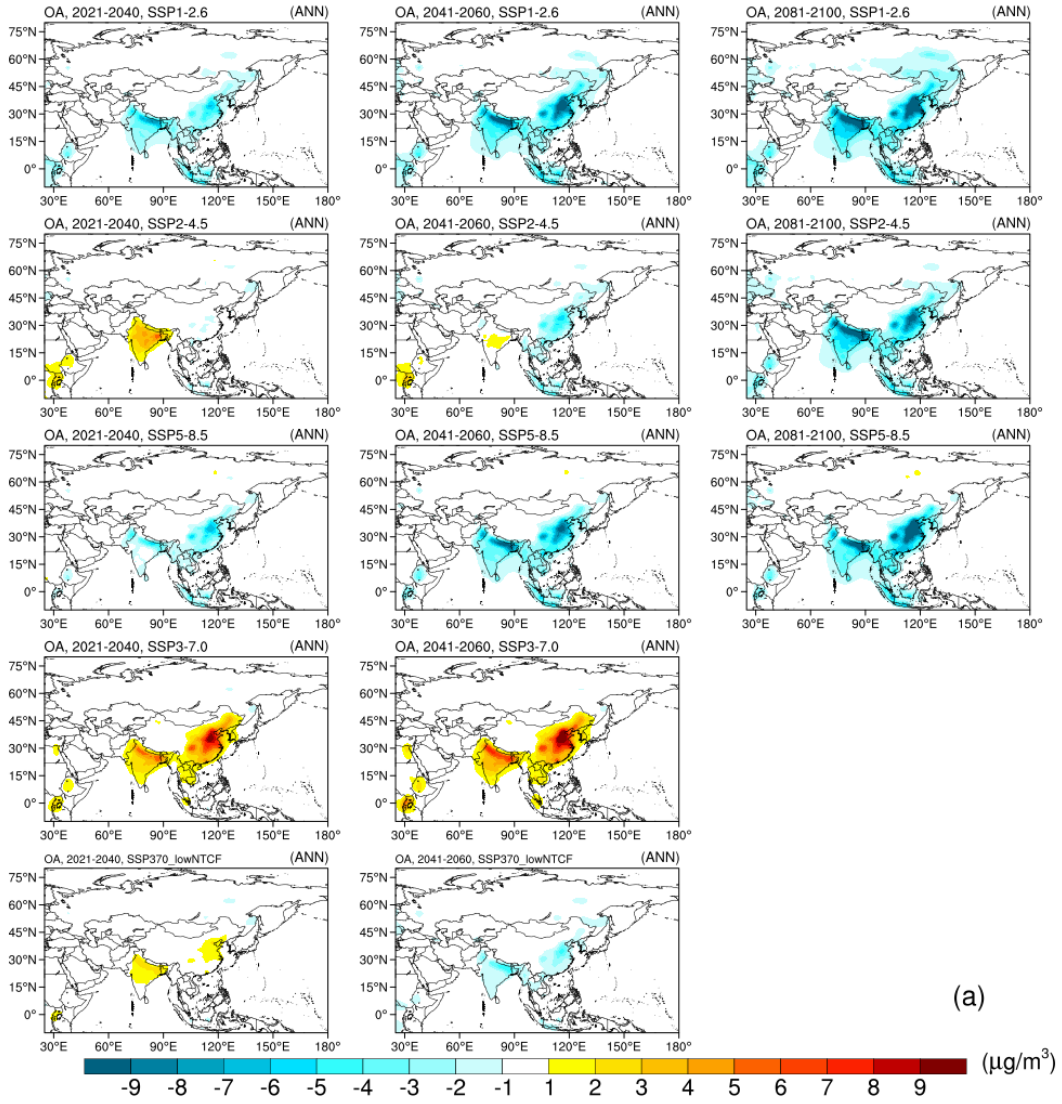
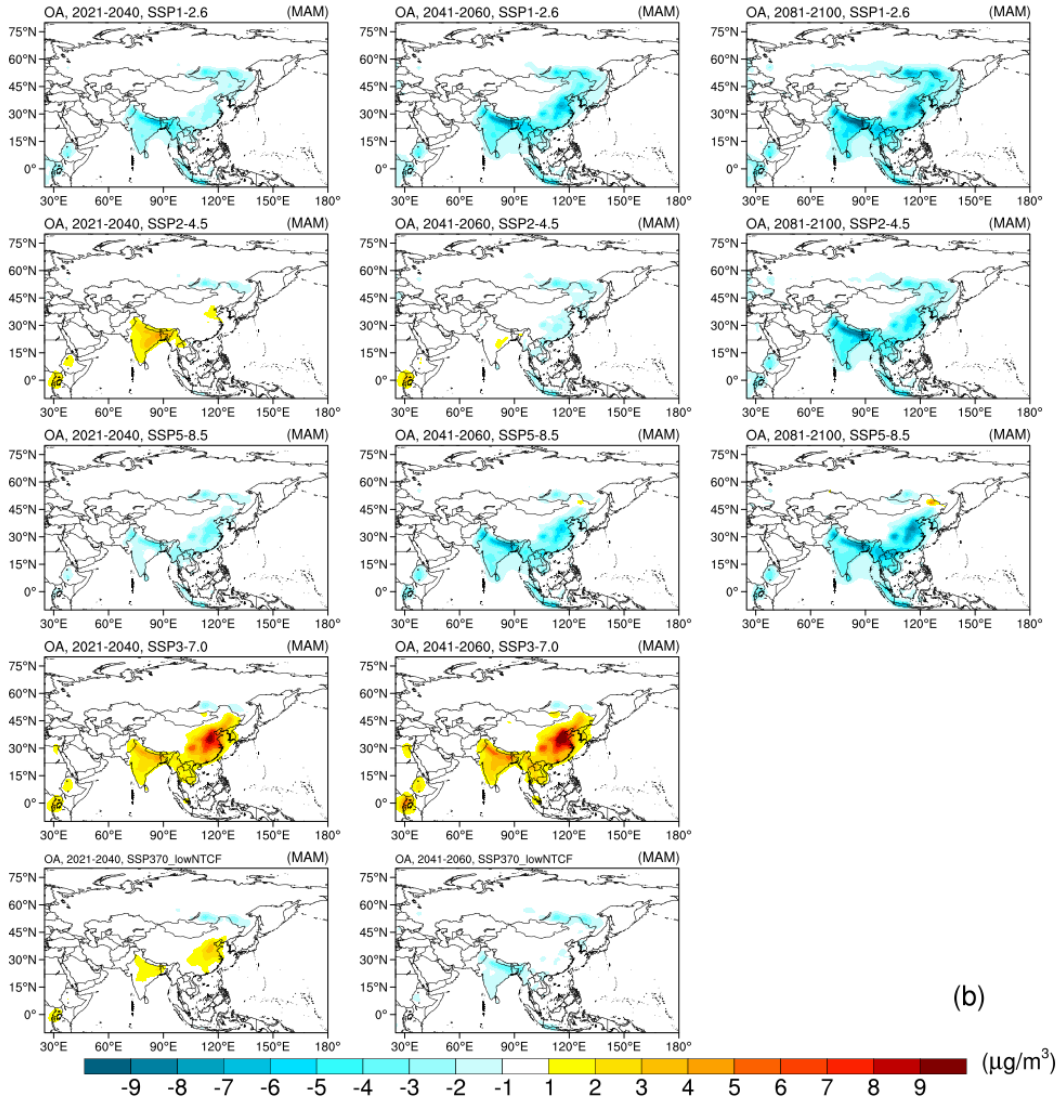
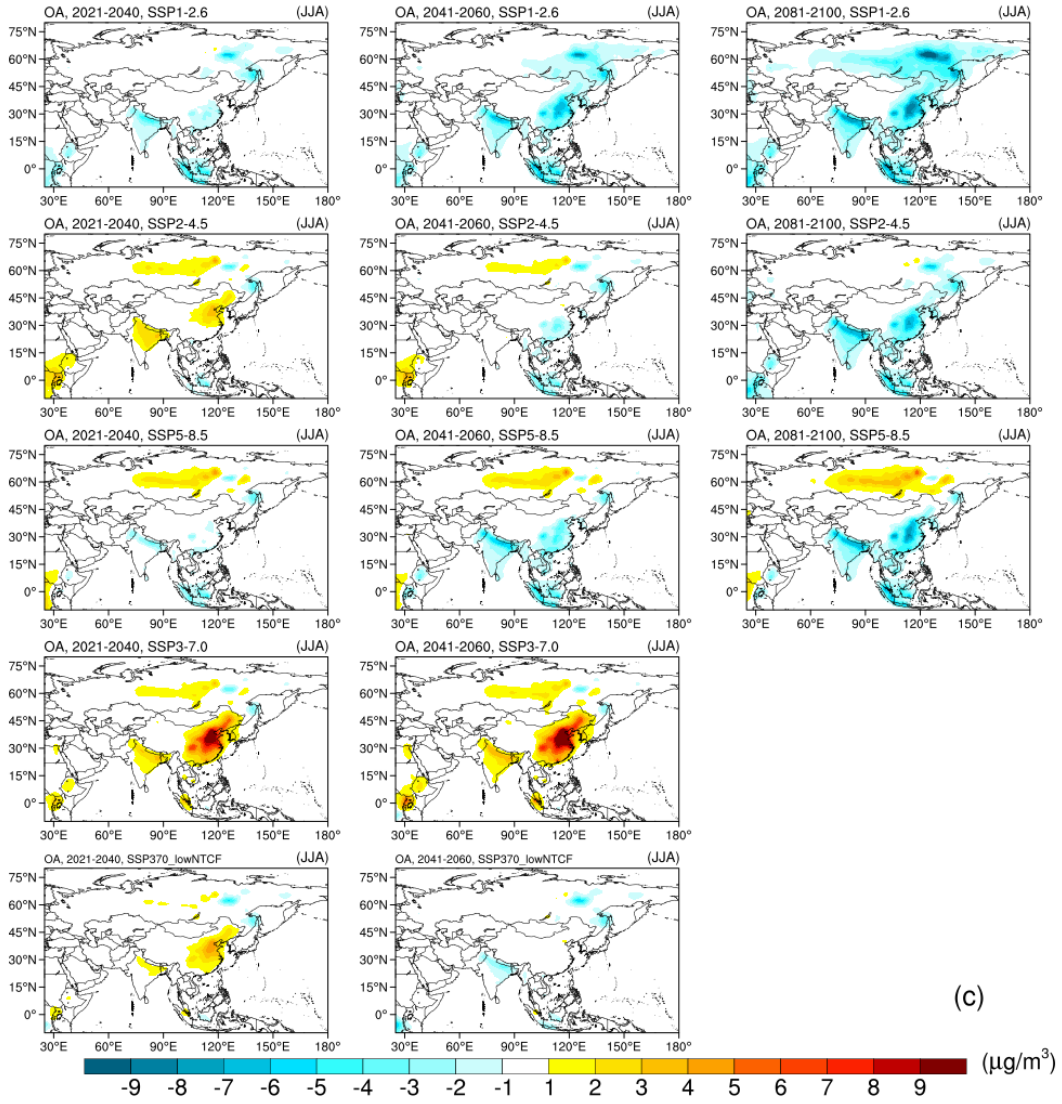
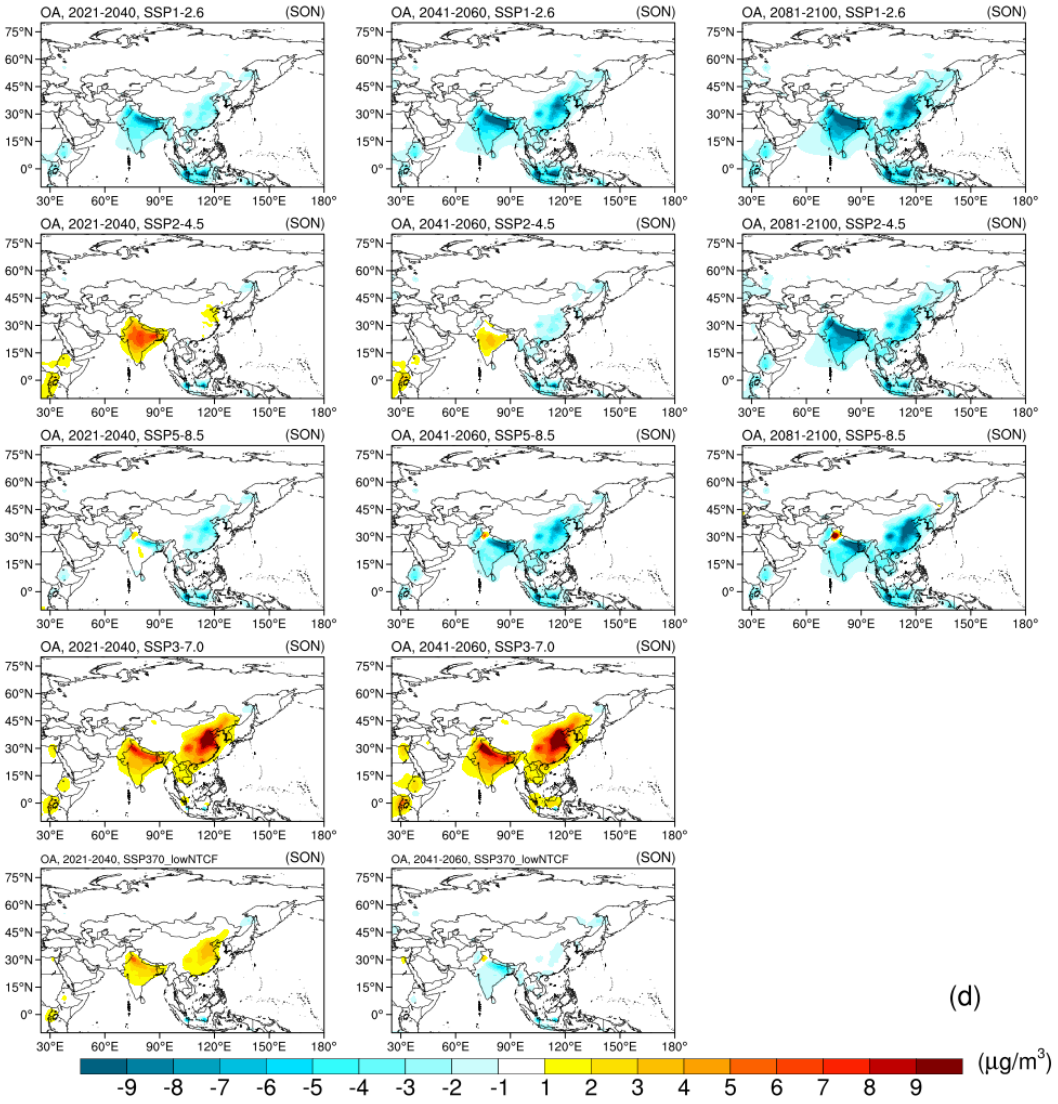


Figure S12 Spatial distribution of projected changes in surface OA concentrations in annual (a), spring (b), summer (c), autumn (d) and winter (e) (units: $\mu g/m^3$) during 2021–2040, 2041–2060 and 2081–2100 under SSPs, relative to 1995–2014.


OA, 2021-2040, SSP1-2.6 (ANN)
OA, 2041-2060, SSP1-2.6 (ANN)
OA, 2081-2100, SSP1-2.6 (ANN)
OA, 2021-2040, SSP2-4.5 (ANN)
OA, 2041-2060, SSP2-4.5 (ANN)
OA, 2081-2100, SSP2-4.5 (ANN)
OA, 2021-2040, SSP5-8.5 (ANN)
OA, 2041-2060, SSP5-8.5 (ANN)
OA, 2081-2100, SSP5-8.5 (ANN)
OA, 2021-2040, SSP3-7.0 (ANN)
OA, 2041-2060, SSP3-7.0 (ANN)
OA, 2021-2040, SSP370_lowNTCF (ANN)
OA, 2041-2060, SSP370_lowNTCF (ANN)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
-9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9
(μg/m3)
(a)


OA, 2021-2040, SSP1-2.6 (MAM)
OA, 2041-2060, SSP1-2.6 (MAM)
OA, 2081-2100, SSP1-2.6 (MAM)
OA, 2021-2040, SSP2-4.5 (MAM)
OA, 2041-2060, SSP2-4.5 (MAM)
OA, 2081-2100, SSP2-4.5 (MAM)
OA, 2021-2040, SSP5-8.5 (MAM)
OA, 2041-2060, SSP5-8.5 (MAM)
OA, 2081-2100, SSP5-8.5 (MAM)
OA, 2021-2040, SSP3-7.0 (MAM)
OA, 2041-2060, SSP3-7.0 (MAM)
OA, 2021-2040, SSP370_lowNTCF (MAM)
OA, 2041-2060, SSP370_lowNTCF (MAM)
75°N
60°N
45°N
30°N
15°N
0°
30°E 60°E 90°E 120°E 150°E 180°
(b)
-9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9
(μg/m3)


OA, 2021-2040, SSP1-2.6 (JJA)
OA, 2041-2060, SSP1-2.6 (JJA)
OA, 2081-2100, SSP1-2.6 (JJA)
OA, 2021-2040, SSP2-4.5 (JJA)
OA, 2041-2060, SSP2-4.5 (JJA)
OA, 2081-2100, SSP2-4.5 (JJA)
OA, 2021-2040, SSP5-8.5 (JJA)
OA, 2041-2060, SSP5-8.5 (JJA)
OA, 2081-2100, SSP5-8.5 (JJA)
OA, 2021-2040, SSP3-7.0 (JJA)
OA, 2041-2060, SSP3-7.0 (JJA)
OA, 2021-2040, SSP370_lowNTCF (JJA)
OA, 2041-2060, SSP370_lowNTCF (JJA)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
(c)
-9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9
(μg/m3)


OA, 2021-2040, SSP1-2.6 (SON)
OA, 2041-2060, SSP1-2.6 (SON)
OA, 2081-2100, SSP1-2.6 (SON)
OA, 2021-2040, SSP2-4.5 (SON)
OA, 2041-2060, SSP2-4.5 (SON)
OA, 2081-2100, SSP2-4.5 (SON)
OA, 2021-2040, SSP5-8.5 (SON)
OA, 2041-2060, SSP5-8.5 (SON)
OA, 2081-2100, SSP5-8.5 (SON)
OA, 2021-2040, SSP3-7.0 (SON)
OA, 2041-2060, SSP3-7.0 (SON)
OA, 2021-2040, SSP370_lowNTCF (SON)
OA, 2041-2060, SSP370_lowNTCF (SON)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
(d)
-9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9
(μg/m3)

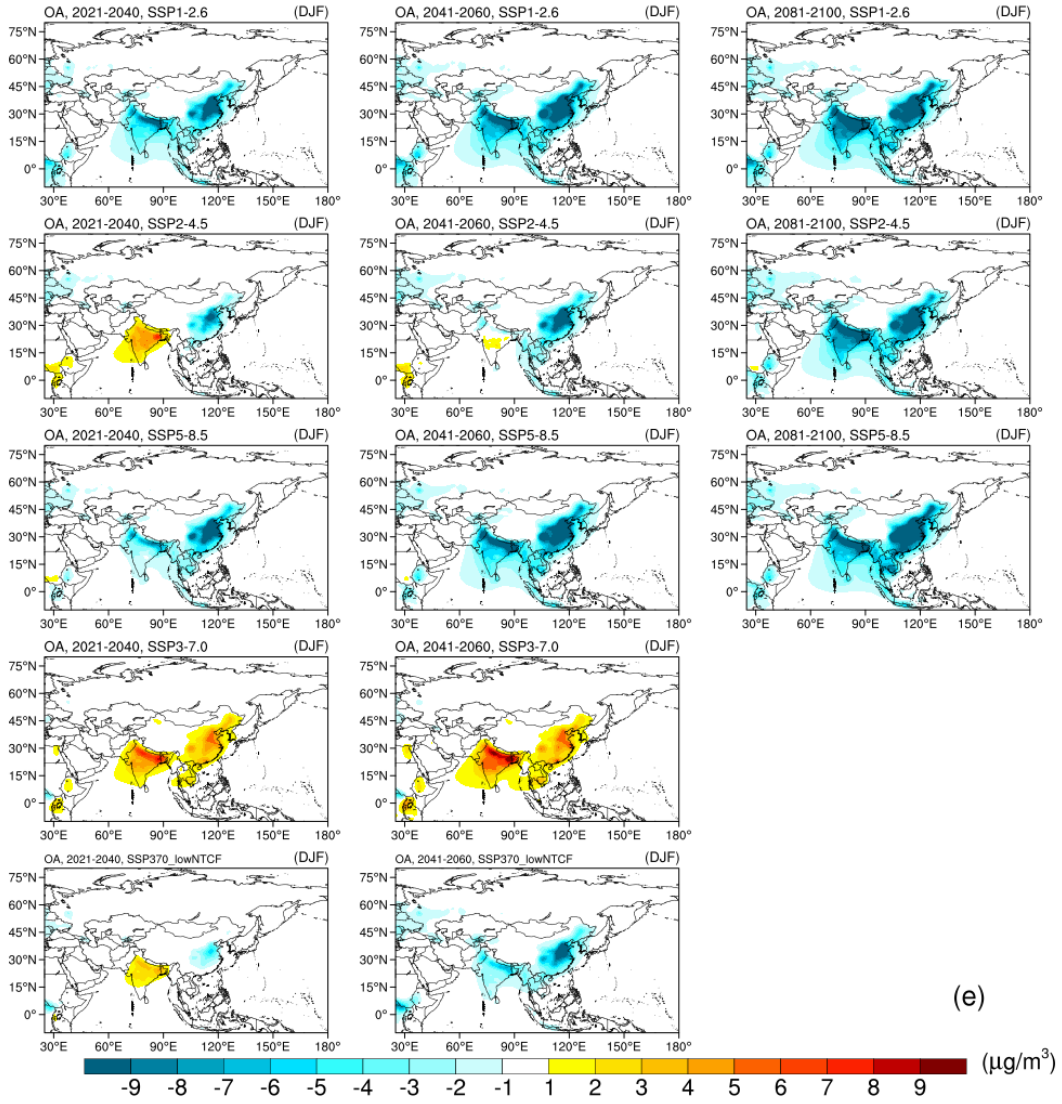
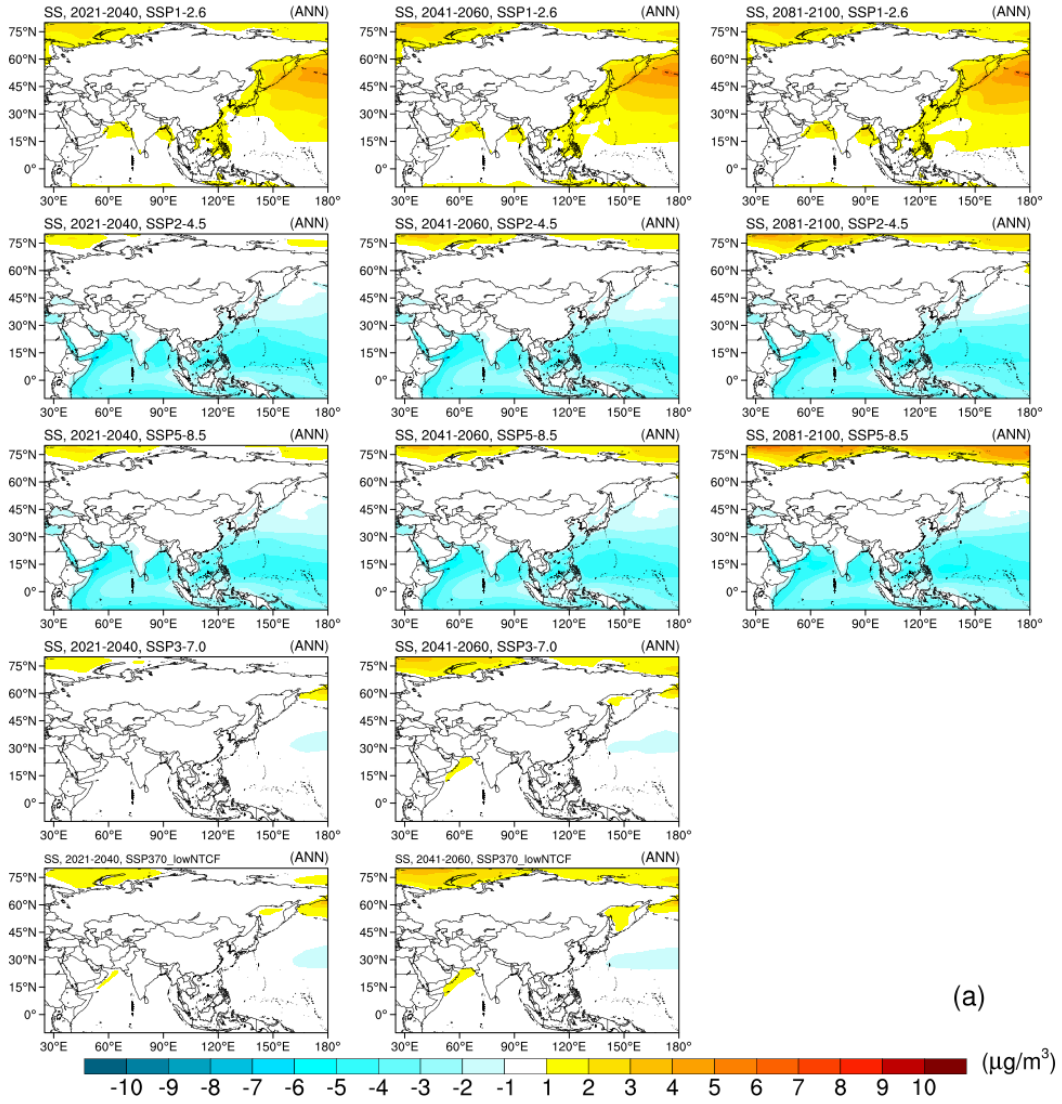
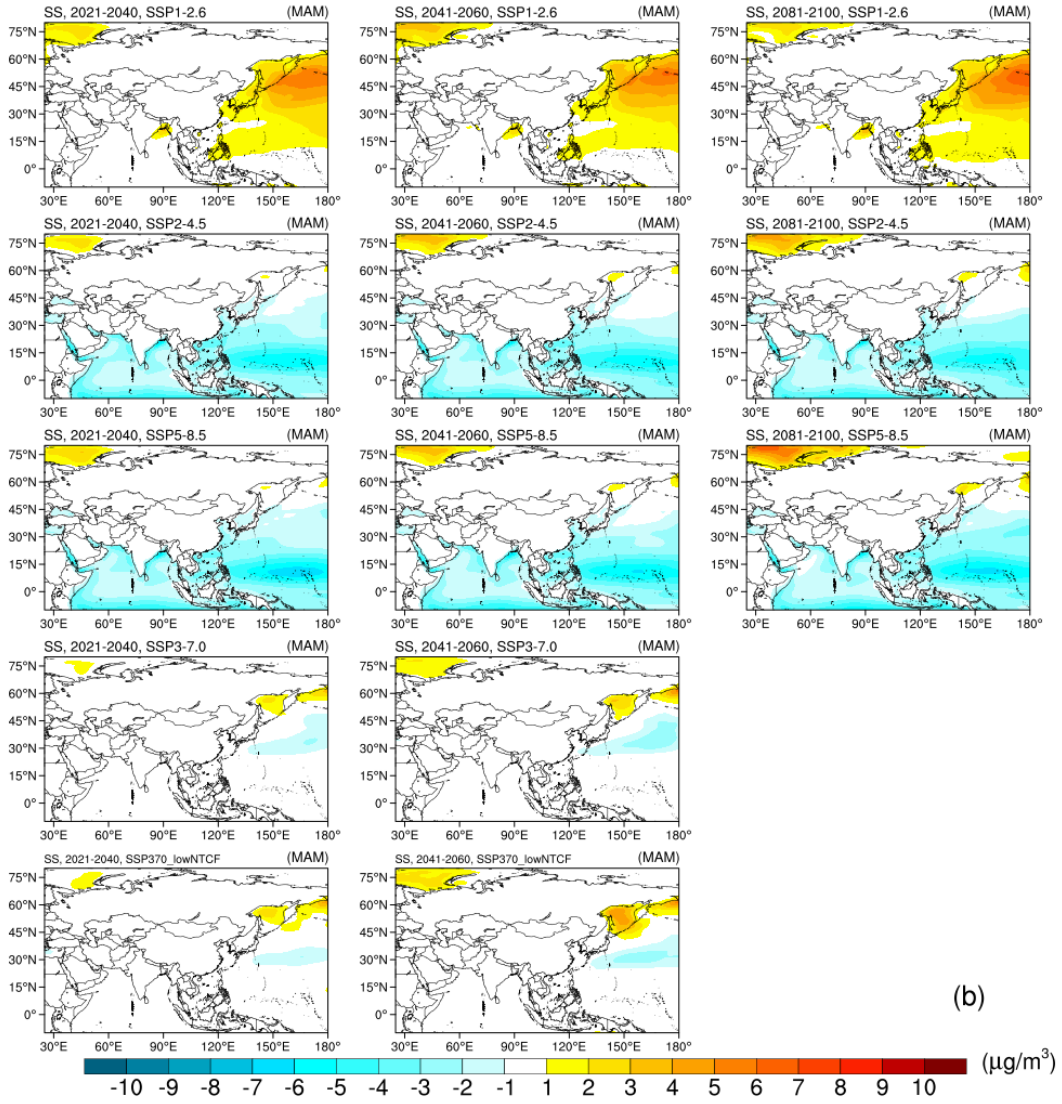
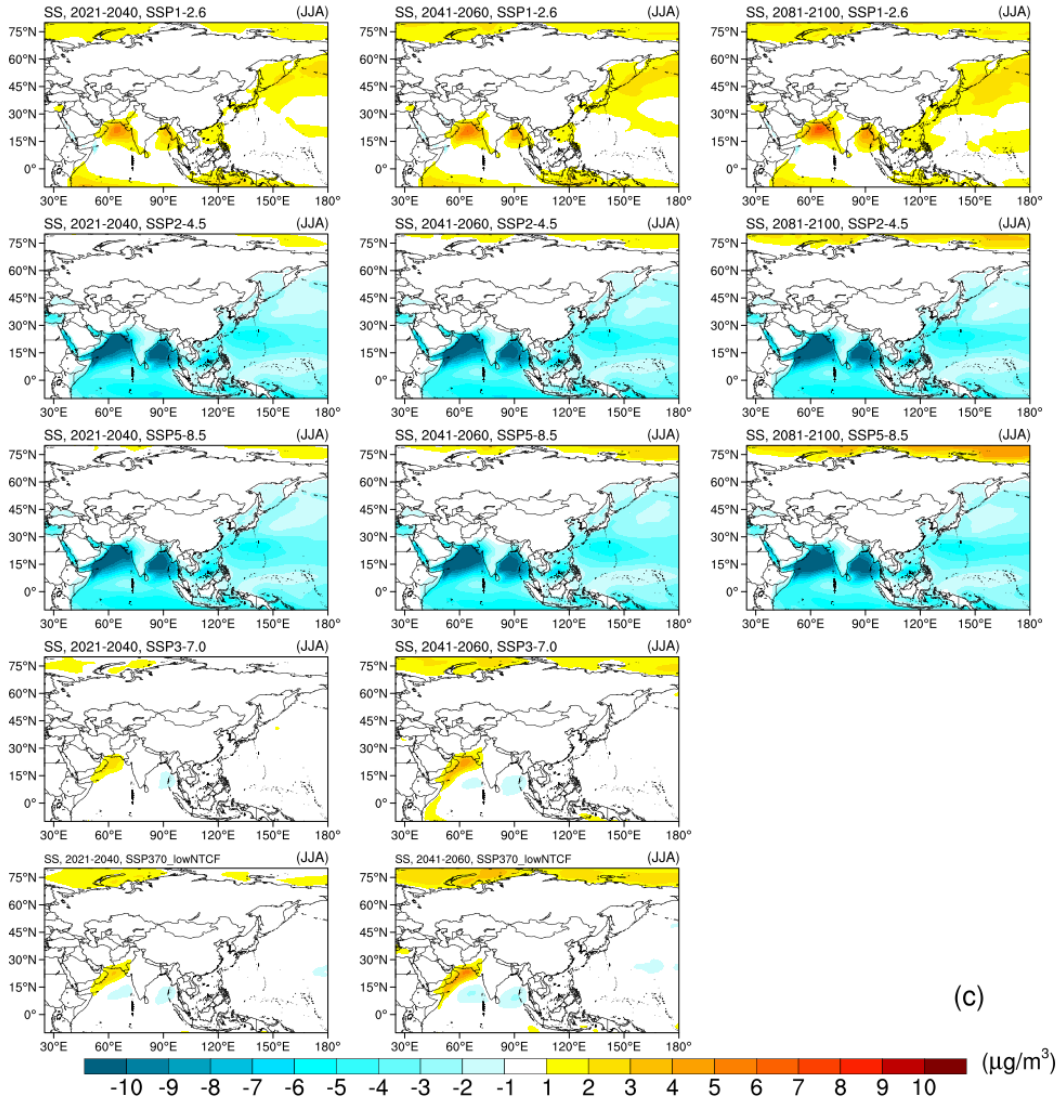
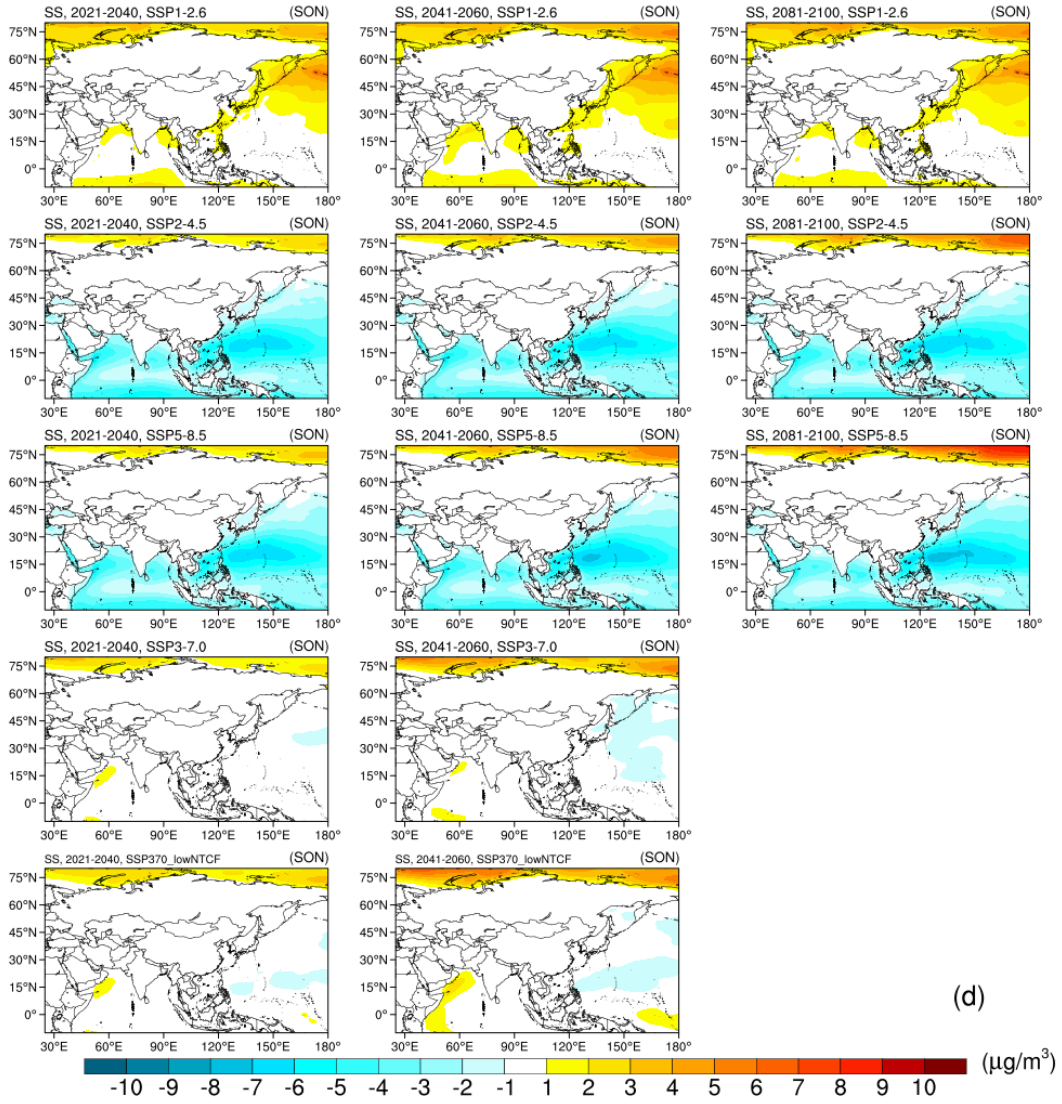


Figure S13 Spatial distribution of projected changes in surface SO_4 concentrations in annual (a), spring (b), summer (c), autumn (d) and winter (e) (units: $\mu g/m^3$) during 2021–2040, 2041–2060 and 2081–2100 under SSPs, relative to 1995–2014.


SS, 2021-2040, SSP1-2.6 (ANN)
SS, 2041-2060, SSP1-2.6 (ANN)
SS, 2081-2100, SSP1-2.6 (ANN)
SS, 2021-2040, SSP2-4.5 (ANN)
SS, 2041-2060, SSP2-4.5 (ANN)
SS, 2081-2100, SSP2-4.5 (ANN)
SS, 2021-2040, SSP5-8.5 (ANN)
SS, 2041-2060, SSP5-8.5 (ANN)
SS, 2081-2100, SSP5-8.5 (ANN)
SS, 2021-2040, SSP3-7.0 (ANN)
SS, 2041-2060, SSP3-7.0 (ANN)
SS, 2021-2040, SSP370_lowNTCF (ANN)
SS, 2041-2060, SSP370_lowNTCF (ANN)
75°N
60°N
45°N
30°N
15°N
0°
30°E 60°E 90°E 120°E 150°E 180°
(a)
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10
(μg/m3)


SS, 2021-2040, SSP1-2.6 (MAM)
SS, 2041-2060, SSP1-2.6 (MAM)
SS, 2081-2100, SSP1-2.6 (MAM)
SS, 2021-2040, SSP2-4.5 (MAM)
SS, 2041-2060, SSP2-4.5 (MAM)
SS, 2081-2100, SSP2-4.5 (MAM)
SS, 2021-2040, SSP5-8.5 (MAM)
SS, 2041-2060, SSP5-8.5 (MAM)
SS, 2081-2100, SSP5-8.5 (MAM)
SS, 2021-2040, SSP3-7.0 (MAM)
SS, 2041-2060, SSP3-7.0 (MAM)
SS, 2021-2040, SSP370_lowNTCF (MAM)
SS, 2041-2060, SSP370_lowNTCF (MAM)
75°N
60°N
45°N
30°N
15°N
0°
30°E 60°E 90°E 120°E 150°E 180°
(b)
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10
(μg/m3)


SS, 2021-2040, SSP1-2.6 (JJA)
SS, 2041-2060, SSP1-2.6 (JJA)
SS, 2081-2100, SSP1-2.6 (JJA)
SS, 2021-2040, SSP2-4.5 (JJA)
SS, 2041-2060, SSP2-4.5 (JJA)
SS, 2081-2100, SSP2-4.5 (JJA)
SS, 2021-2040, SSP5-8.5 (JJA)
SS, 2041-2060, SSP5-8.5 (JJA)
SS, 2081-2100, SSP5-8.5 (JJA)
SS, 2021-2040, SSP3-7.0 (JJA)
SS, 2041-2060, SSP3-7.0 (JJA)
SS, 2021-2040, SSP370_lowNTCF (JJA)
SS, 2041-2060, SSP370_lowNTCF (JJA)
75°N
60°N
45°N
30°N
15°N
0°
30°E 60°E 90°E 120°E 150°E 180°
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10
(μg/m3)
(c)


SS, 2021-2040, SSP1-2.6 (SON)
SS, 2041-2060, SSP1-2.6 (SON)
SS, 2081-2100, SSP1-2.6 (SON)
SS, 2021-2040, SSP2-4.5 (SON)
SS, 2041-2060, SSP2-4.5 (SON)
SS, 2081-2100, SSP2-4.5 (SON)
SS, 2021-2040, SSP5-8.5 (SON)
SS, 2041-2060, SSP5-8.5 (SON)
SS, 2081-2100, SSP5-8.5 (SON)
SS, 2021-2040, SSP3-7.0 (SON)
SS, 2041-2060, SSP3-7.0 (SON)
SS, 2021-2040, SSP370_lowNTCF (SON)
SS, 2041-2060, SSP370_lowNTCF (SON)
75°N
60°N
45°N
30°N
15°N
0°
30°E
60°E
90°E
120°E
150°E
180°
(d)
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10
(μg/m3)

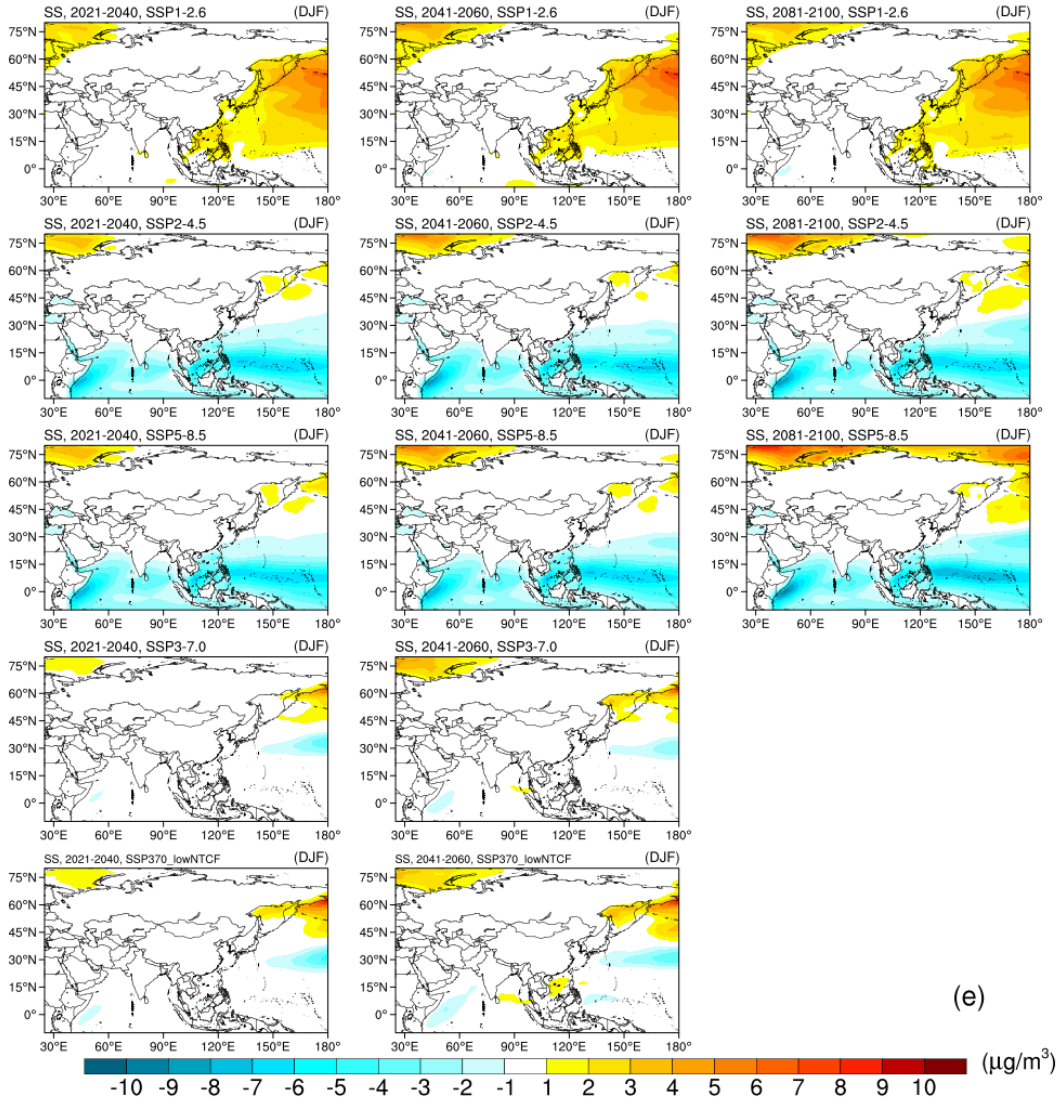


Figure S14 Spatial distribution of projected changes in surface SS concentrations in annual (a), spring (b), summer (c), autumn (d) and winter (e) (units: $\mu g/m^3$) during 2021–2040, 2041–2060 and 2081–2100 under SSPs, relative to 1995–2014.