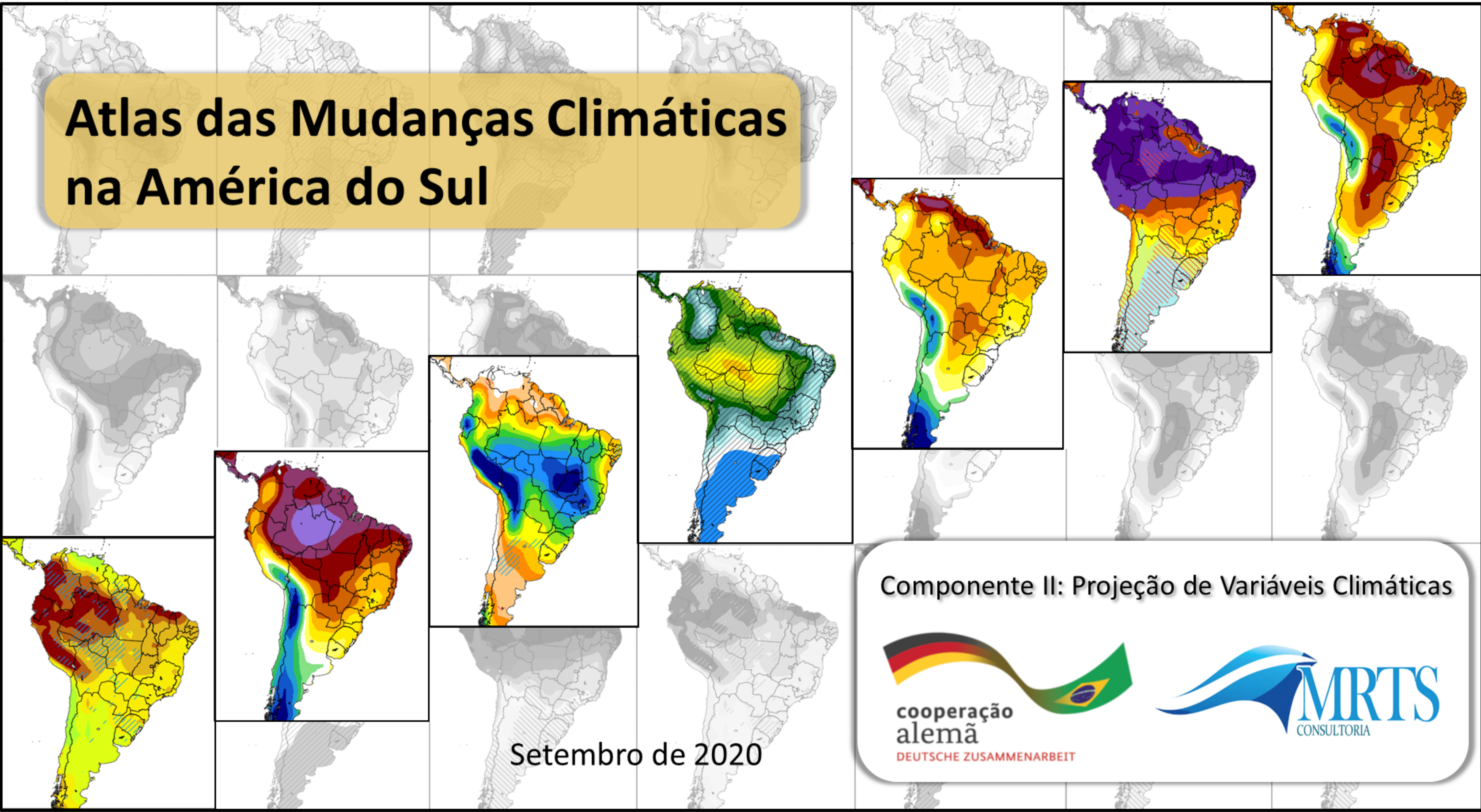


Atlas das Mudanças Climáticas na América do Sul



Setembro de 2020

Componente II: Projeção de Variáveis Climáticas

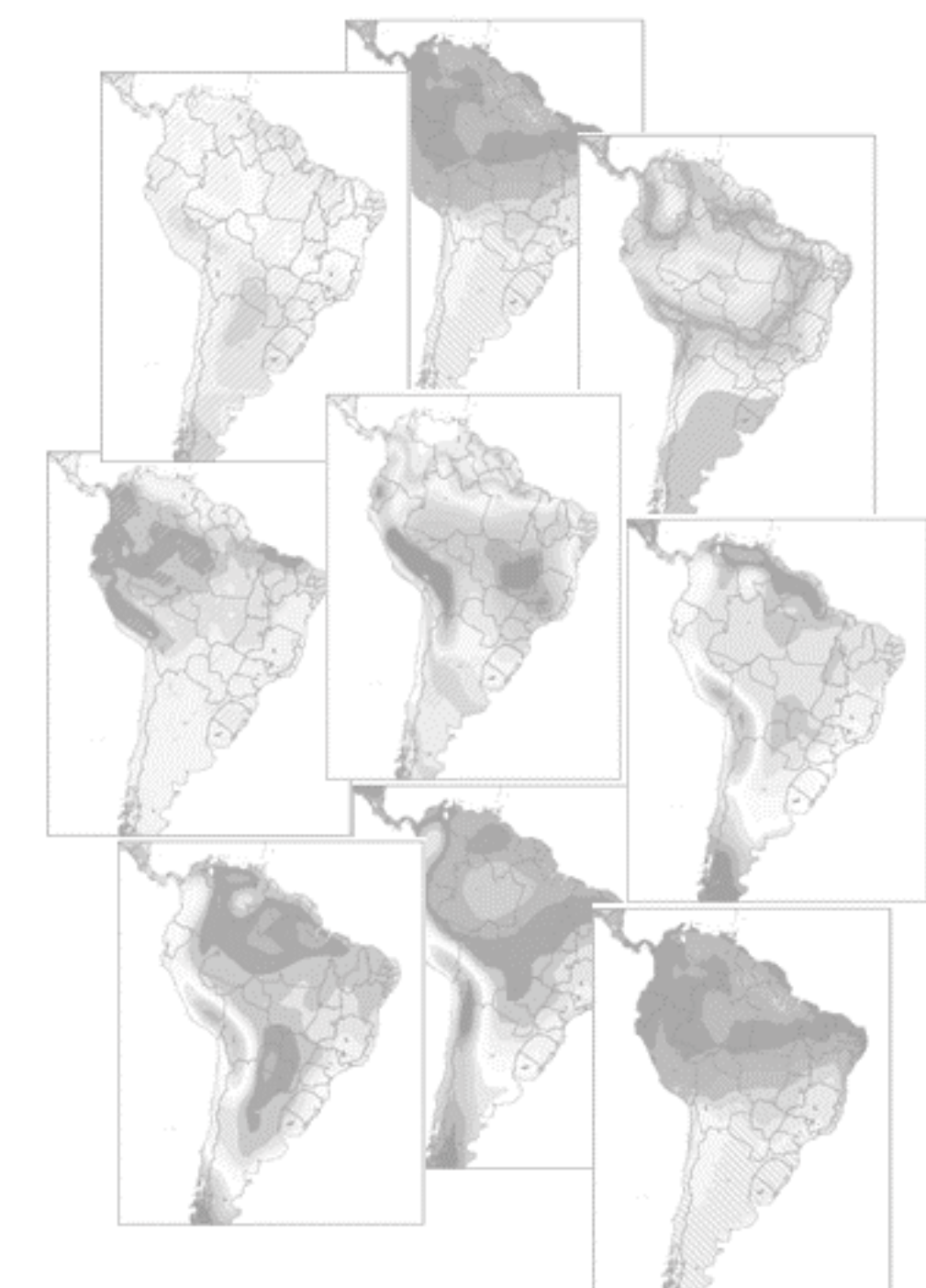


cooperação
alemã
DEUTSCHE ZUSAMMENARBEIT



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Introdução

O estudo utiliza projeções climáticas provenientes de modelos climáticos globais e do modelo regional Eta. Os modelos globais utilizados são: *Canadian Earth System Model* (CanESM2; Chylek et al., 2011, Arora et al., 2011), *Hadley Centre Global Environmental Model - Earth System* (HadGEM2-ES; Collins et al., 2011; Martin et al., 2011) e *Model for Interdisciplinary Research on Climate version 5* (MIROC5, Watanabe et al., 2010). O modelo regional Eta (Pesquero et al., 2010 Chou et al., 2012) foi aninhado às saídas destes três modelos globais, bem como às saídas do *Brazilian Earth System Model* (BESM) (Chou et al., 2014), a fim de prover projeções em alta resolução (20 km) para a América do Sul. Esses modelos foram utilizados na técnica de *downscaling* por serem capazes de representar as características da circulação atmosférica na América do Sul (Chou et al., 2014).

São analisados dois *timeslices* e três cenários climáticos (RCP4.5, RCP6.0 e RCP8.5). O primeiro *timeslice* corresponde ao presente 1980-2005. Esse período foi considerado por ter maior disponibilidade de dados observados. Nesse estudo, os dados do *Climate Prediction Center* (CPC) são usados para validar os modelos no período histórico. O modelo Eta só possui os cenários RCP4.5 e RCP8.5. O período futuro é 2050-2080.

Os índices climáticos foram computados sazonalmente utilizando a metodologia do CCI/WCRP/JCOMM *Expert Team on Climate Change Detection and Indices* (ETCCDI). Detalhes sobre esse assunto são fornecidos em Marrafon e Reboita (2020). Os índices foram computados por modelo, cenário e *timeslice* e, só após, que o ensemble foi gerado. A lista dos índices calculados é apresentada no sumário e as figuras nesse documento seguem a mesma ordem. Para maiores detalhes sobre os índices podem ser obtidos em: http://etccdi.pacificclimate.org/list_27_indices.shtml

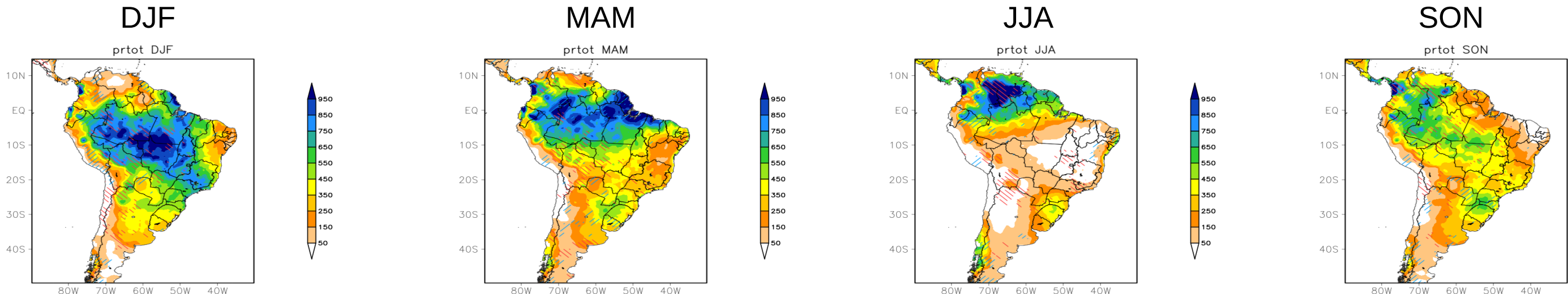
As figuras também destacam as informações que possuem tendência estatisticamente significativas, com nível de confiança de 90%. Tendências significativas positivas em vermelho (azul) remetem ao aumento (diminuição) da temperatura ou diminuição (aumento) de chuva. Por exemplo, nos índices PRCTOT, CWD, TN10P, TX10P, TXn, TNn e R95p as tendências positivas aparecem em azul e nos índices TX90p, TN90p, CDD, TNx e TXx, as tendências positivas aparecem em vermelho.

21/09/2020

Michelle Simões Reboita

PRCTOT - Precipitação Acumulada (mm)

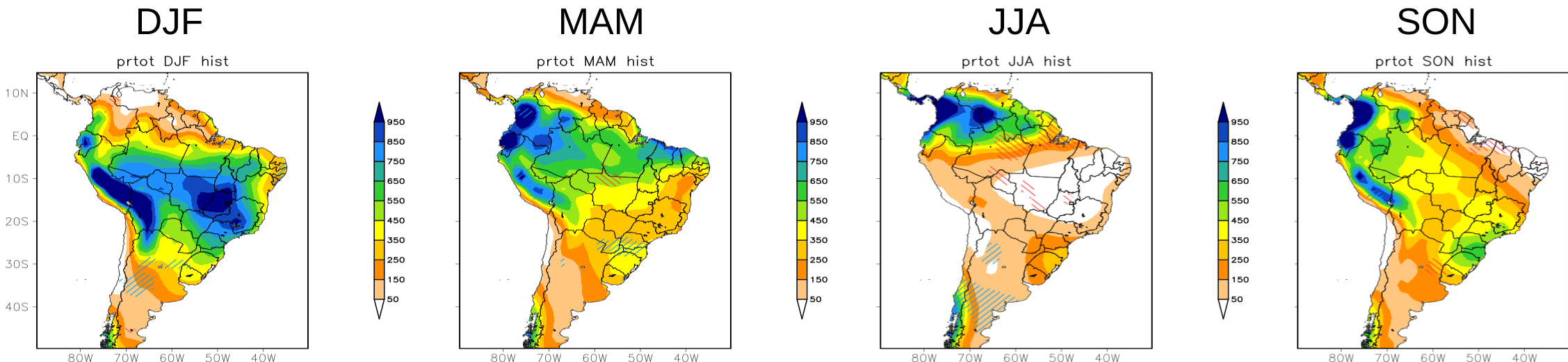
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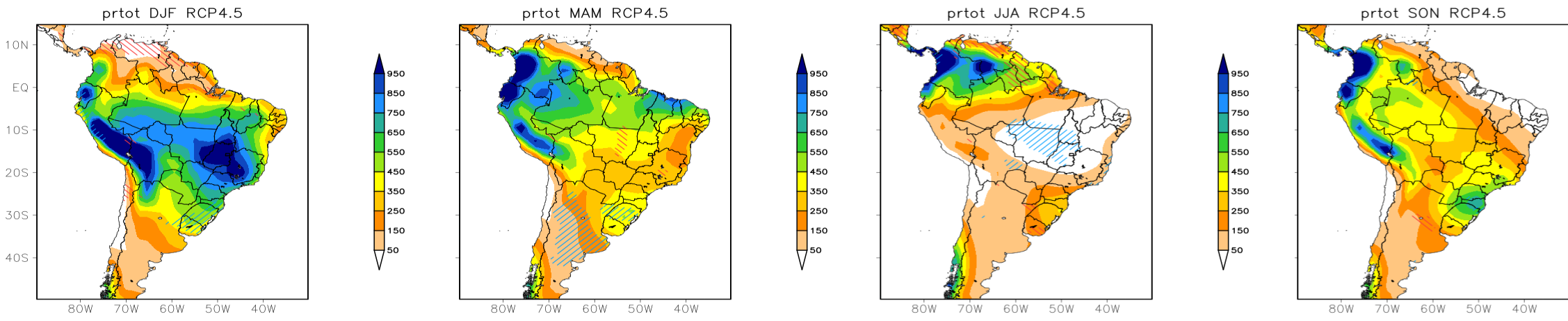
GCMs

ETA

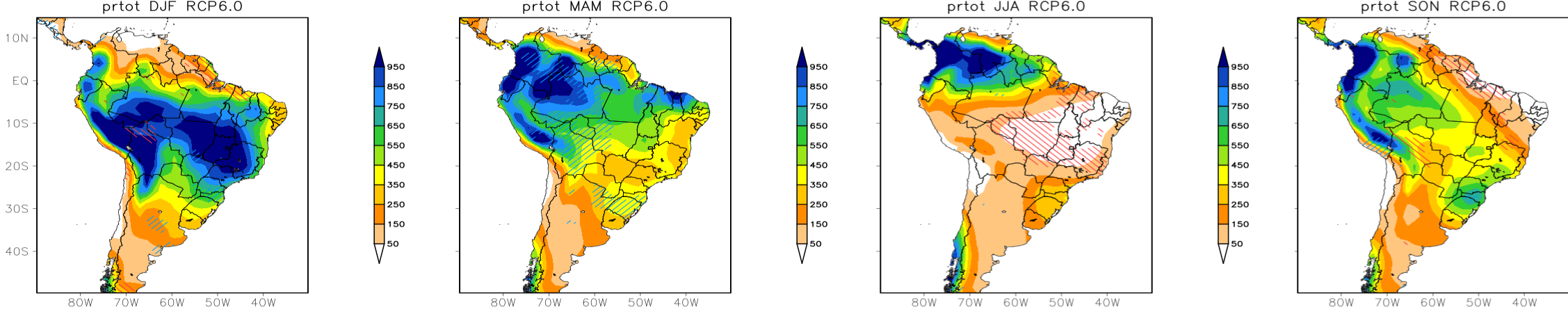
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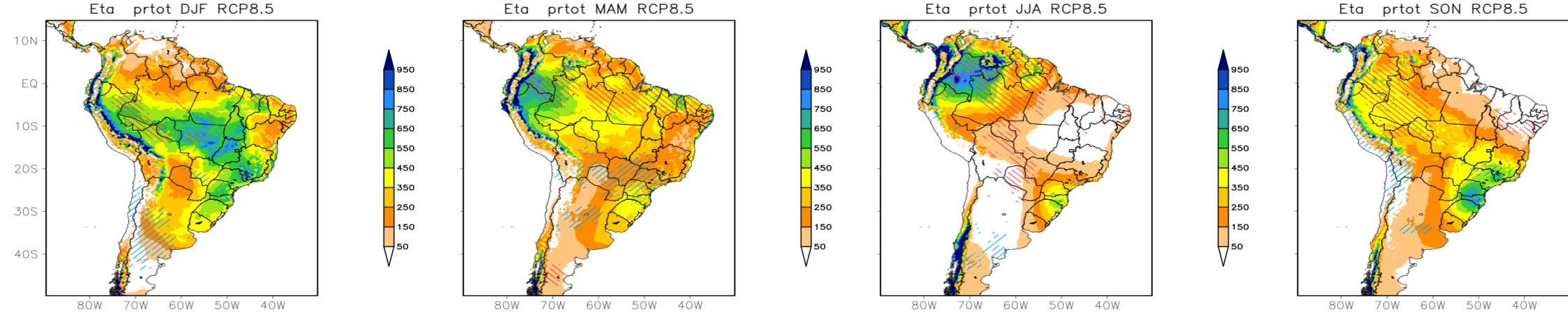
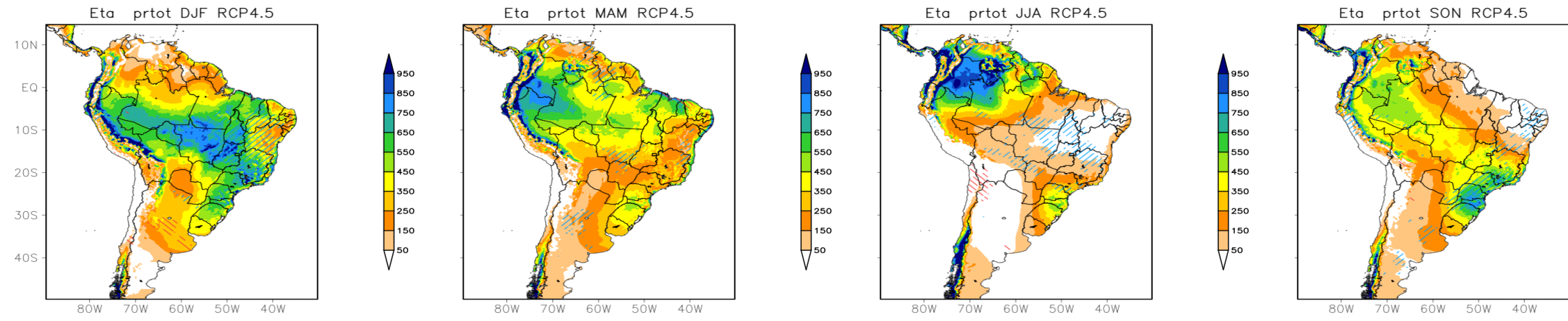
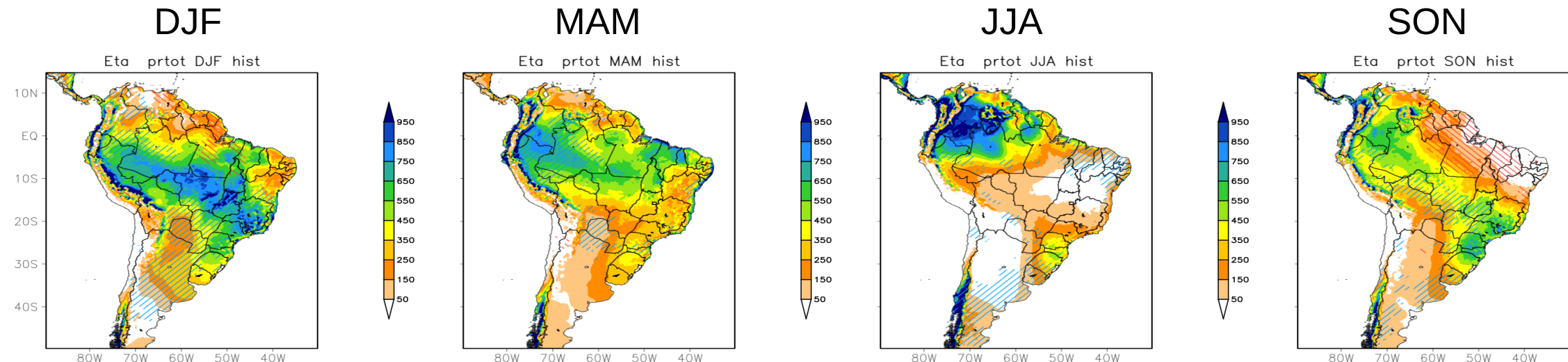
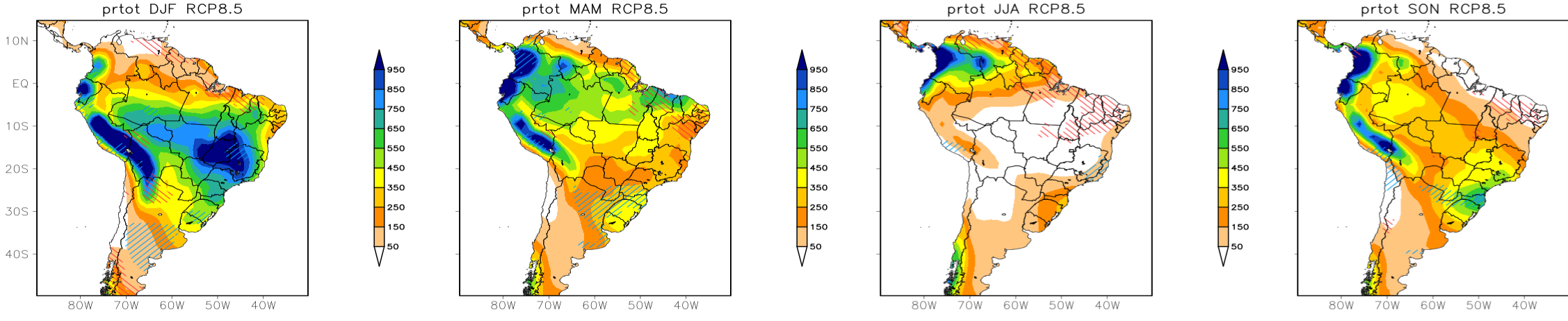
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RCP6.0



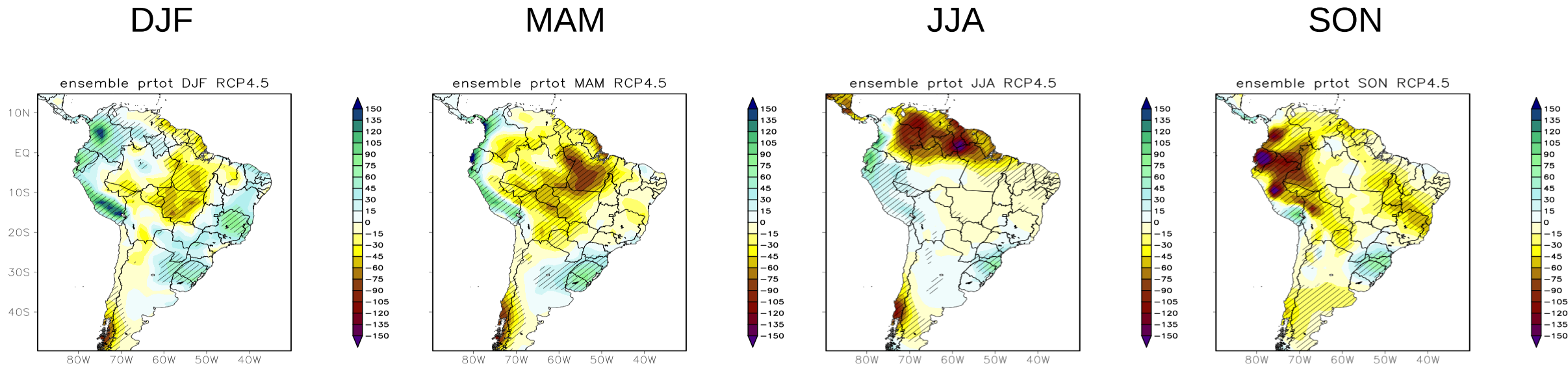
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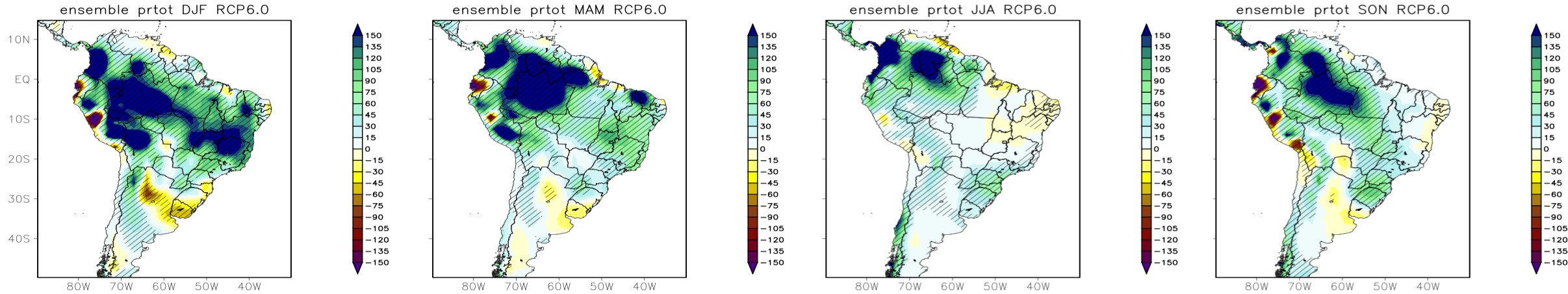
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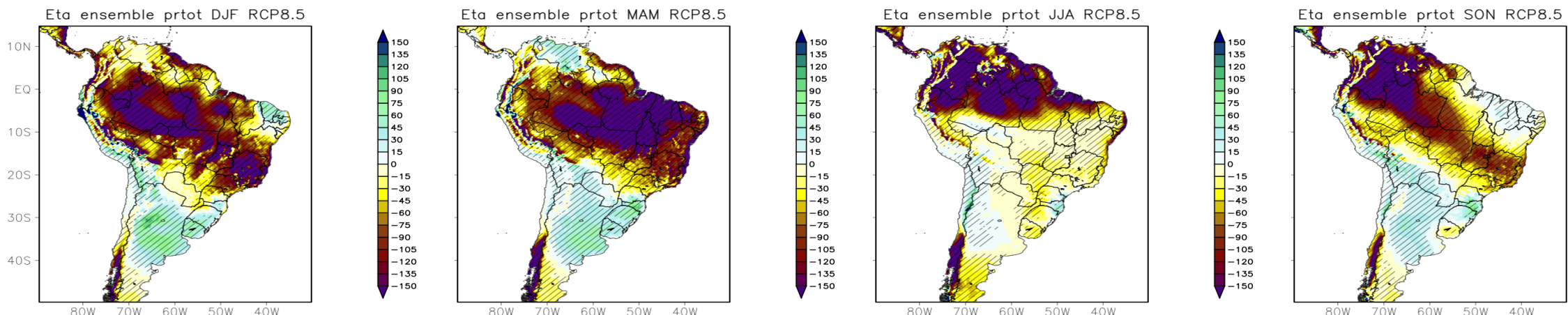
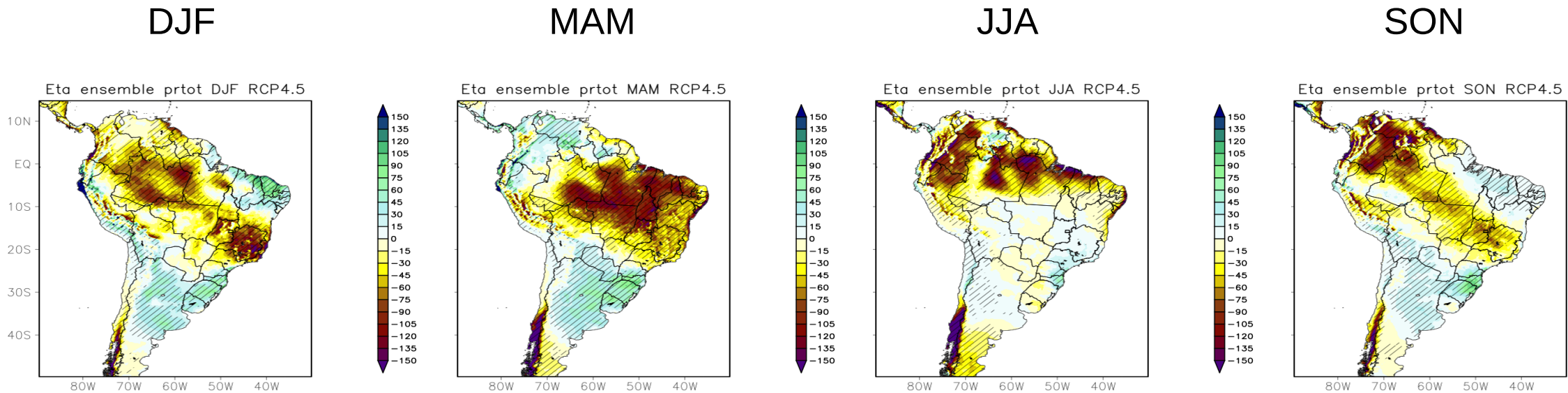
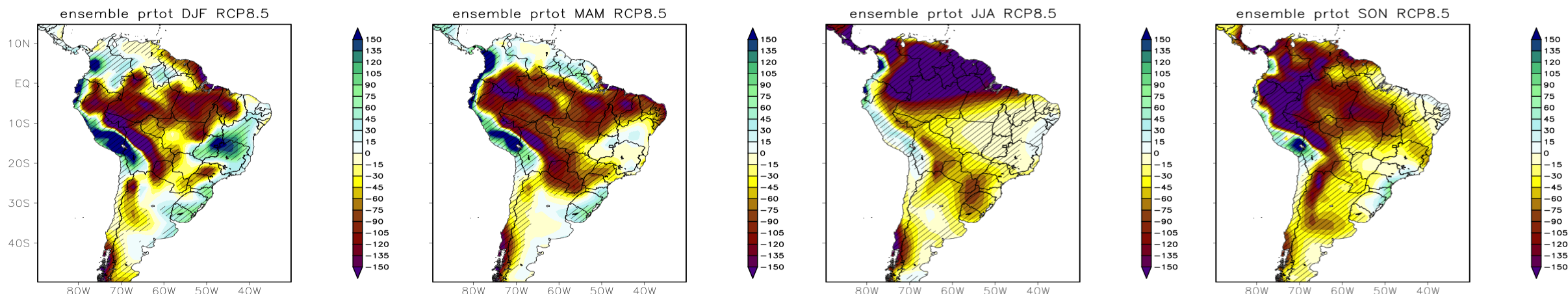
RCP4.5



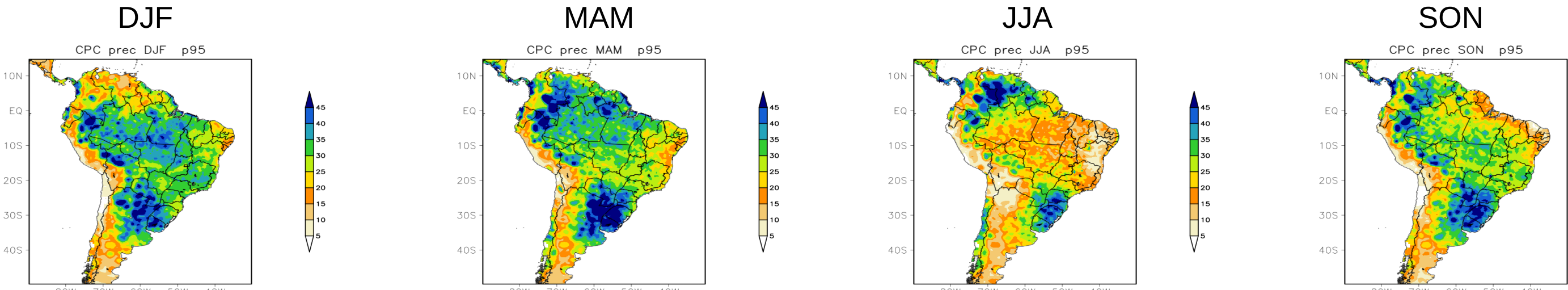
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RCP8.5



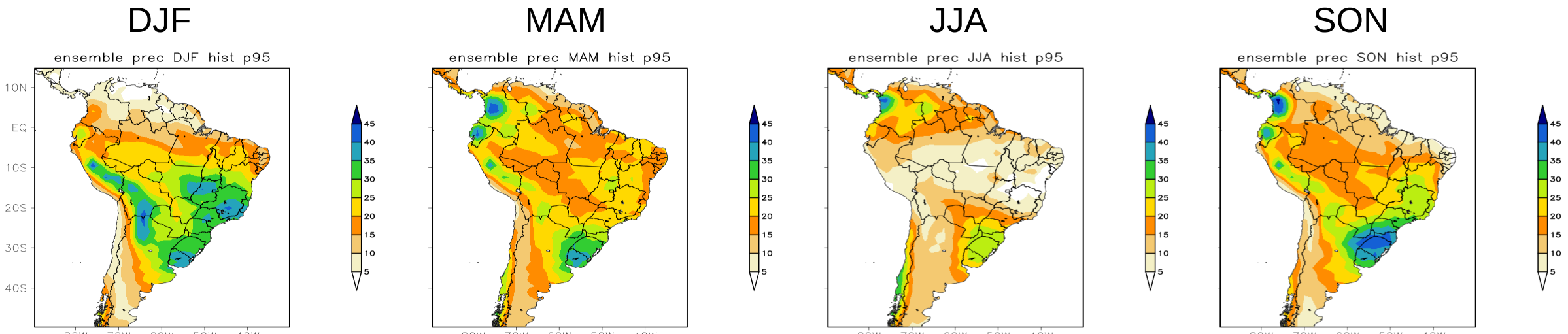
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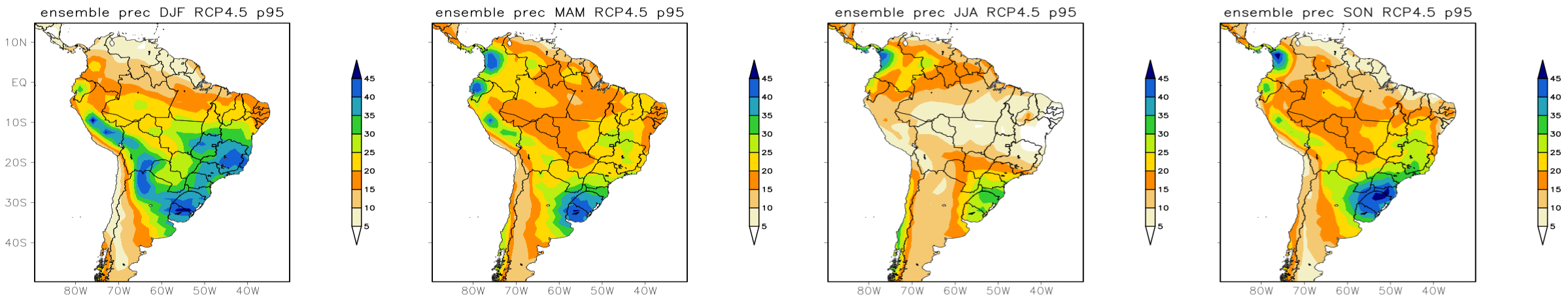
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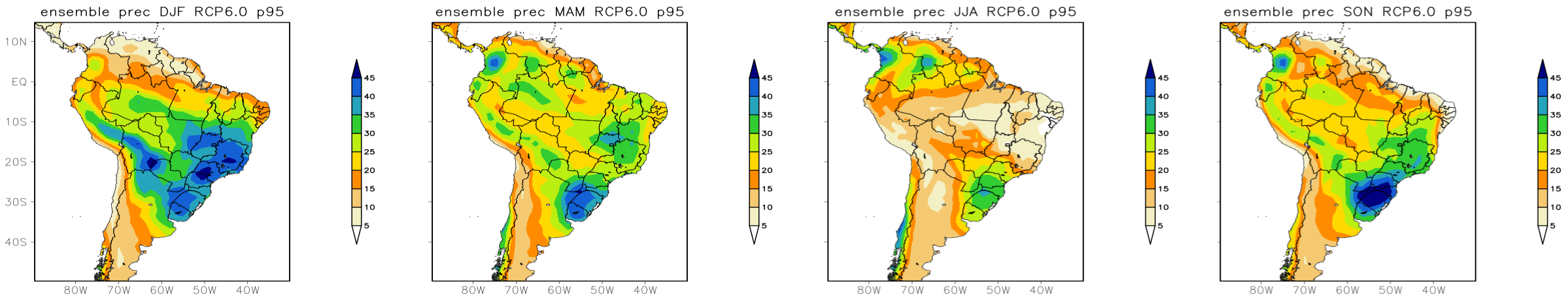
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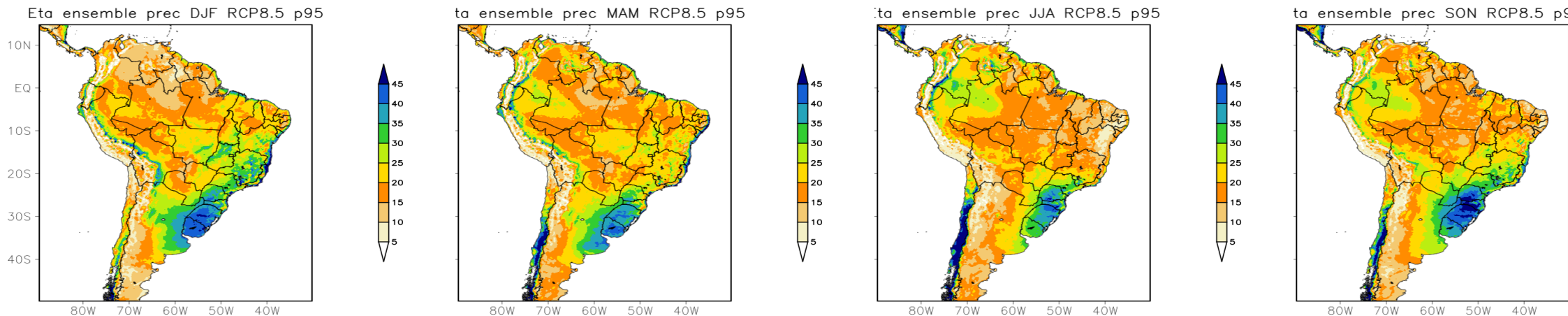
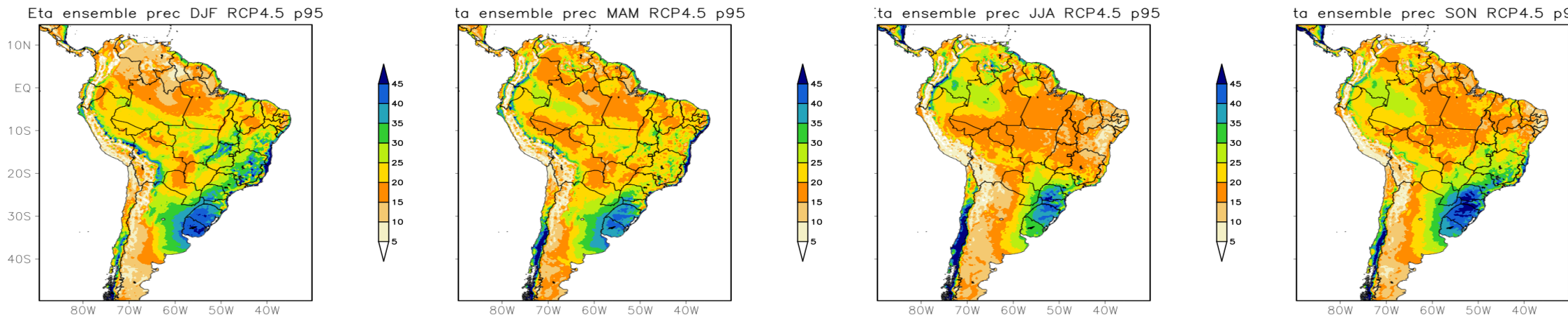
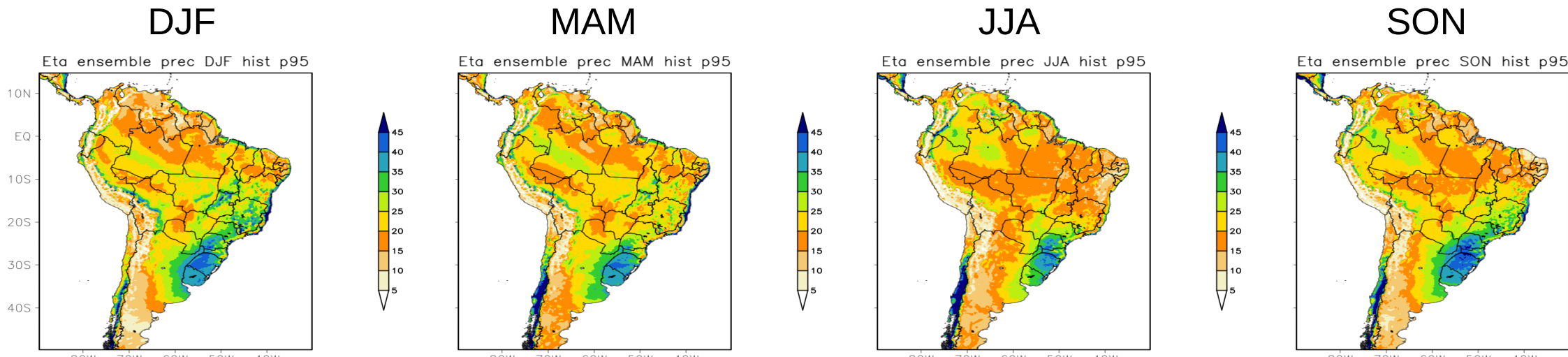
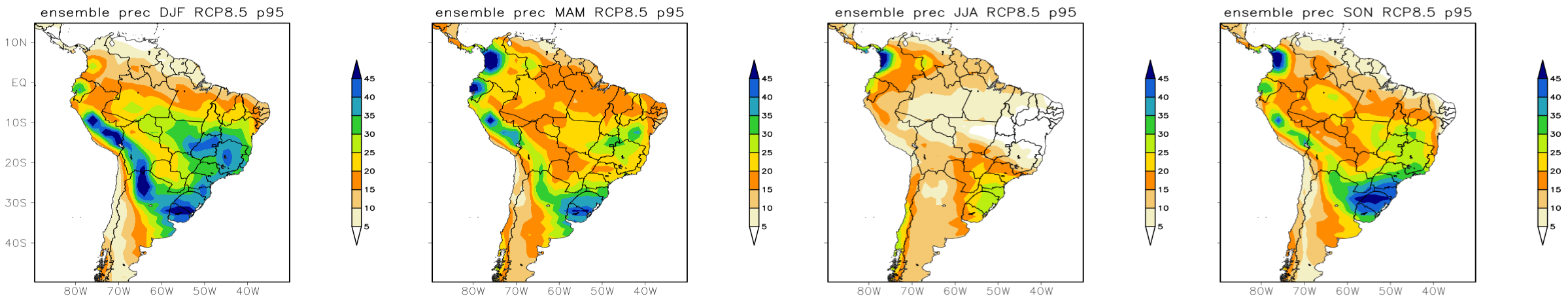
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RCP6.0



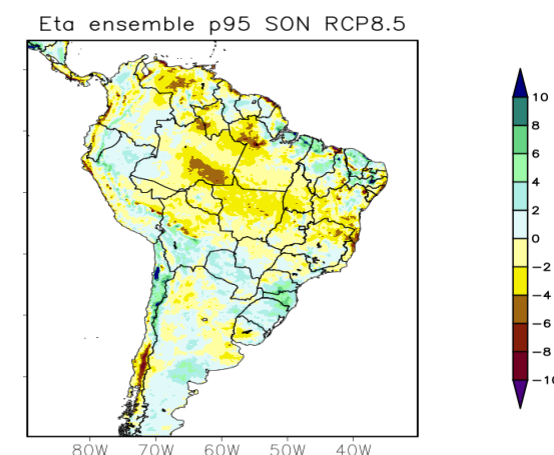
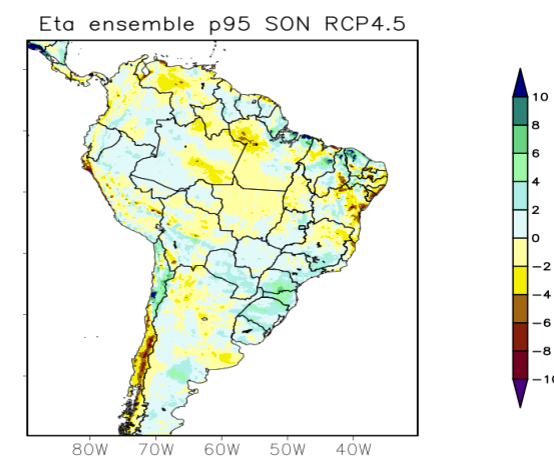
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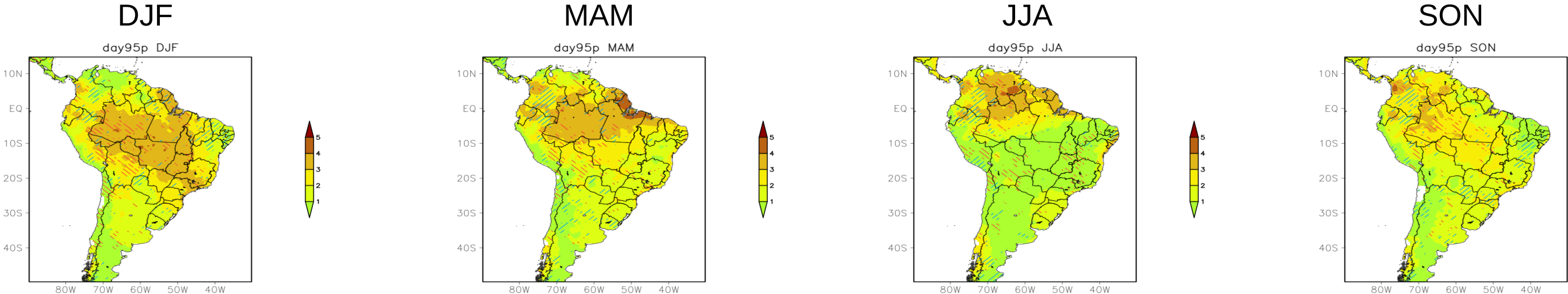
SON

RCP8.5



R95p - Número de dias em que a precipitação excede ao percentil de 95% (dias)

CPC

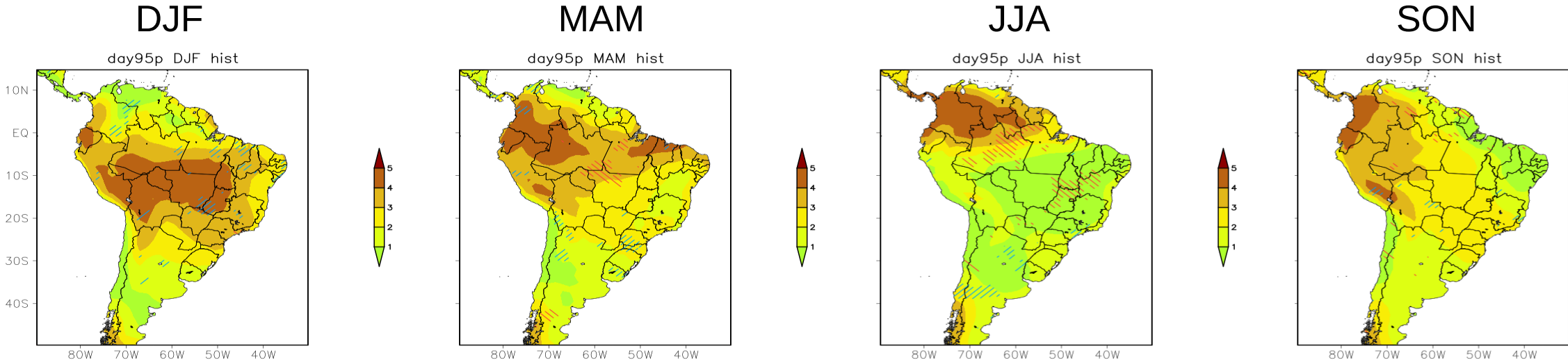


Para o futuro foi utilizado como limiar o P95 do presente

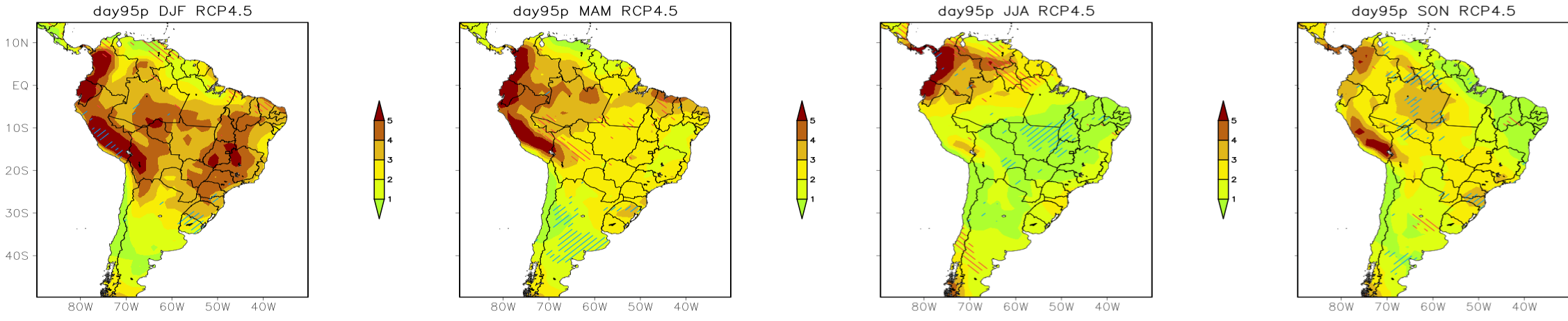
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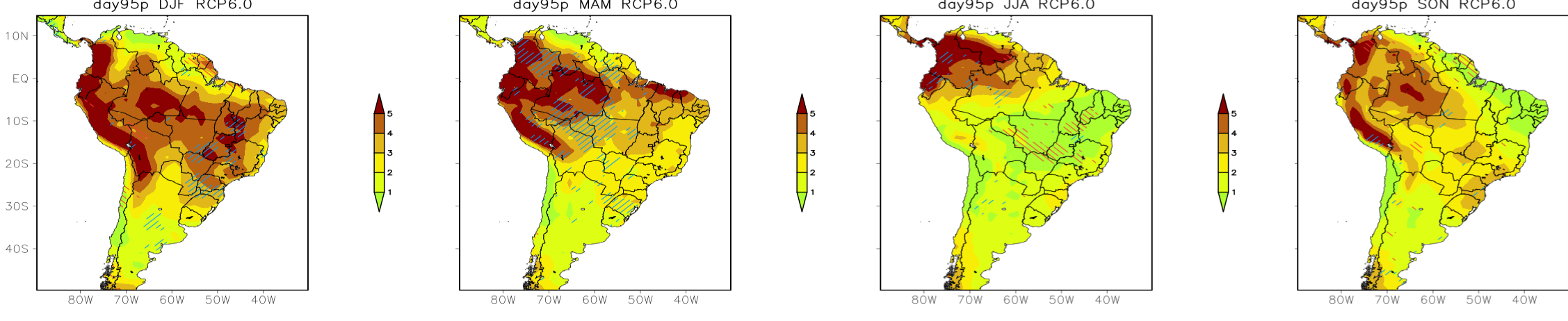
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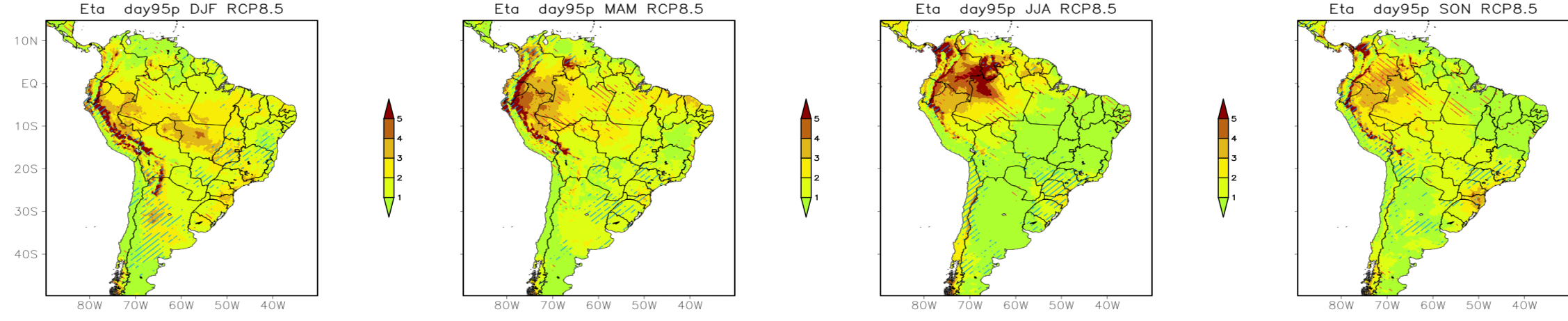
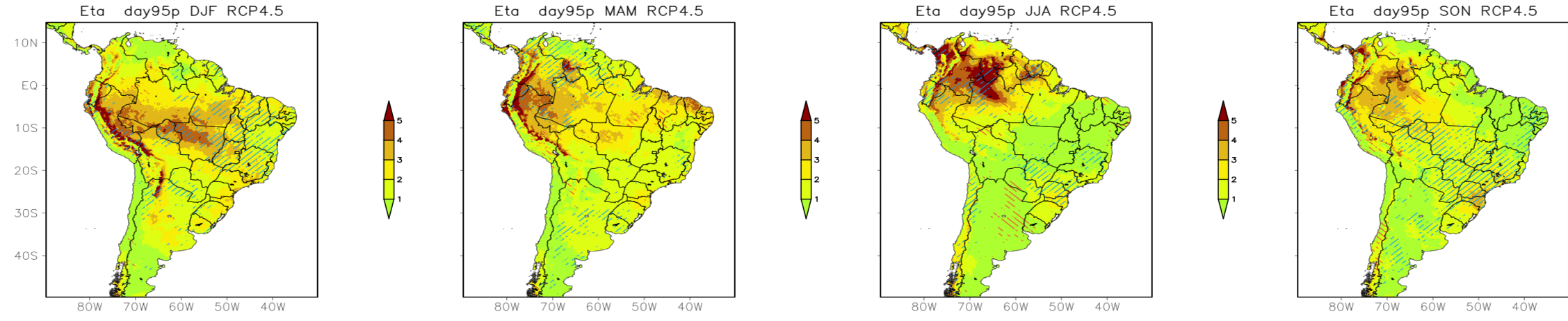
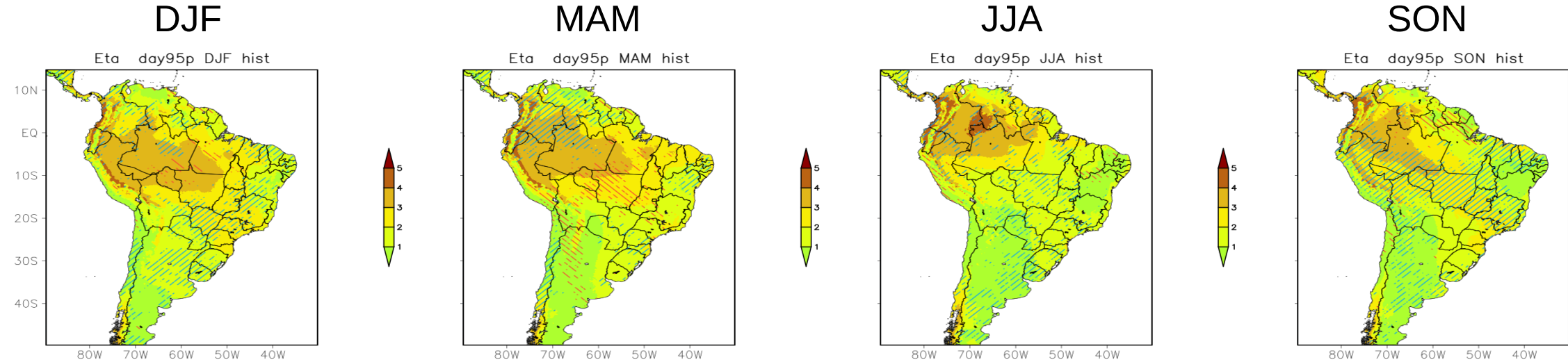
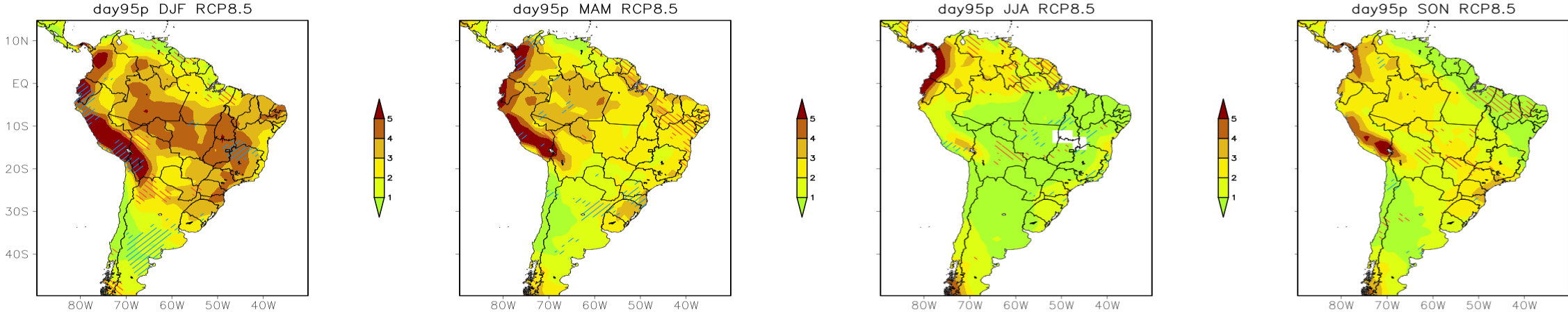
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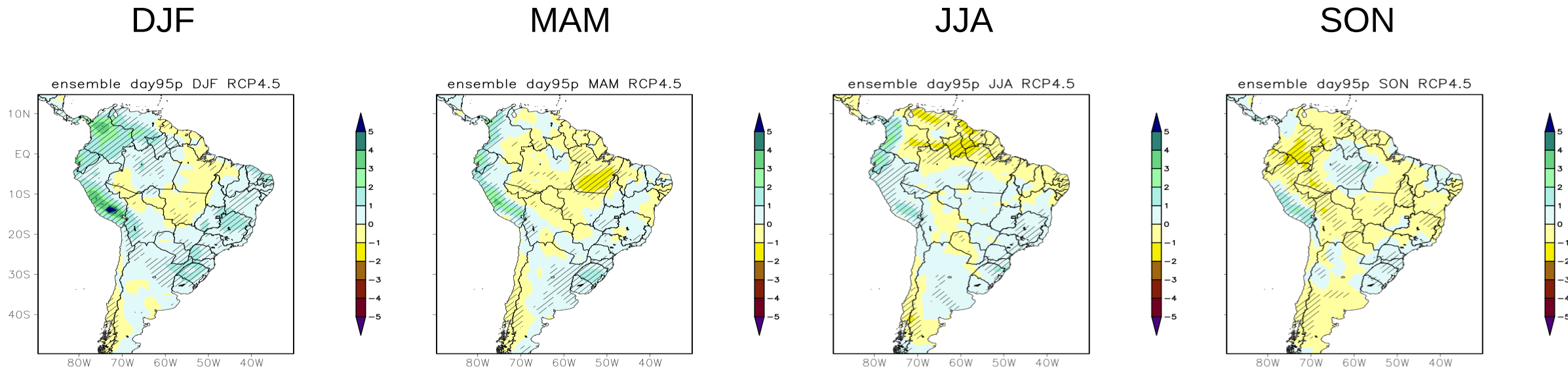
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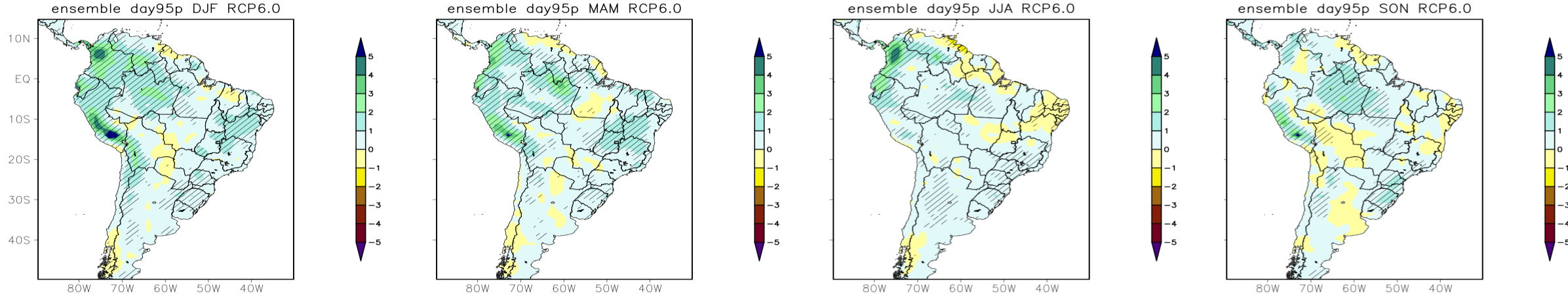
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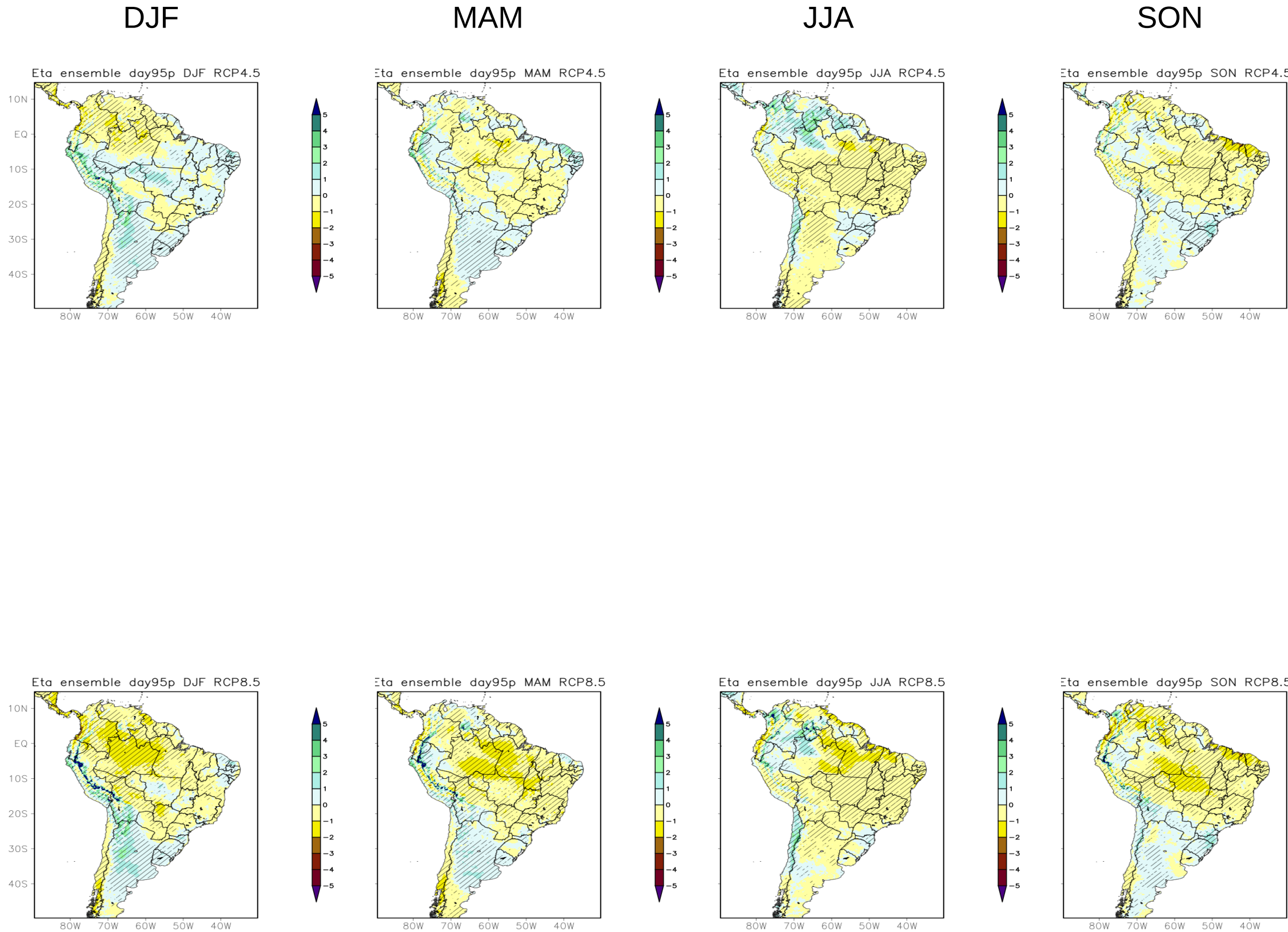
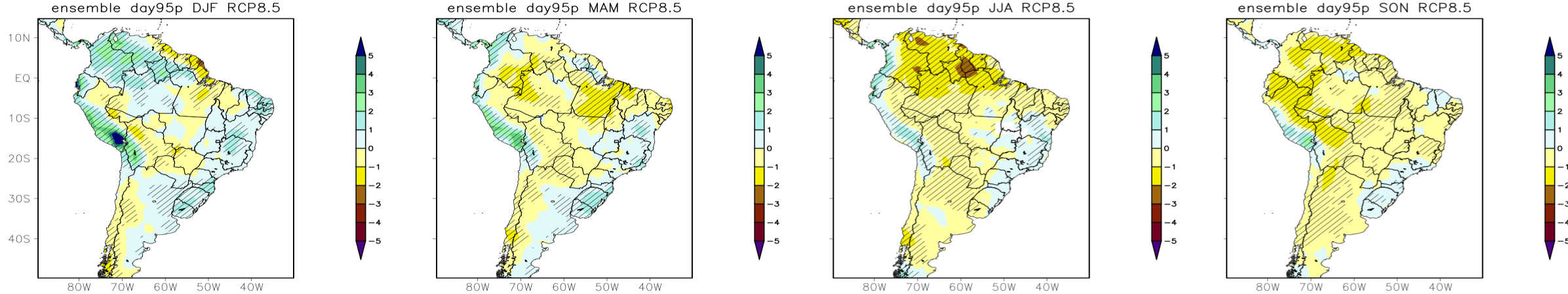
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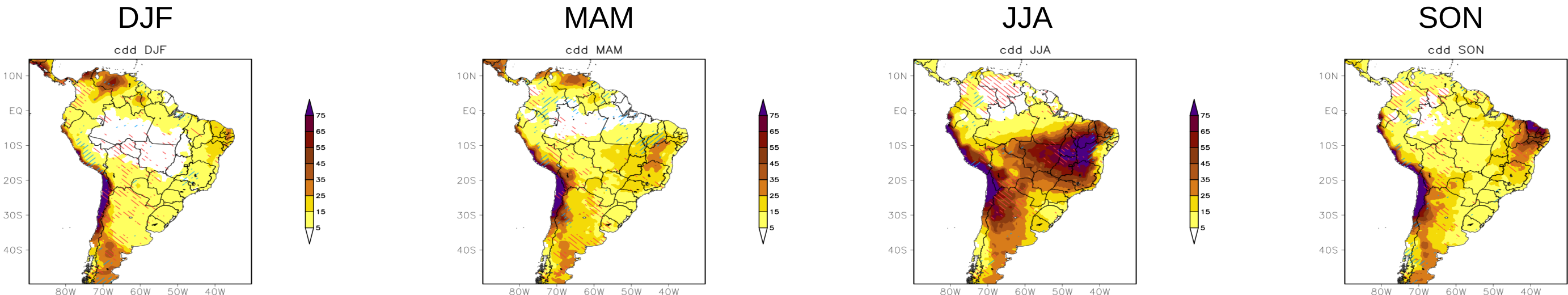


RCP8.5



CDD - Maior sequência de dias secos consecutivos (dias)

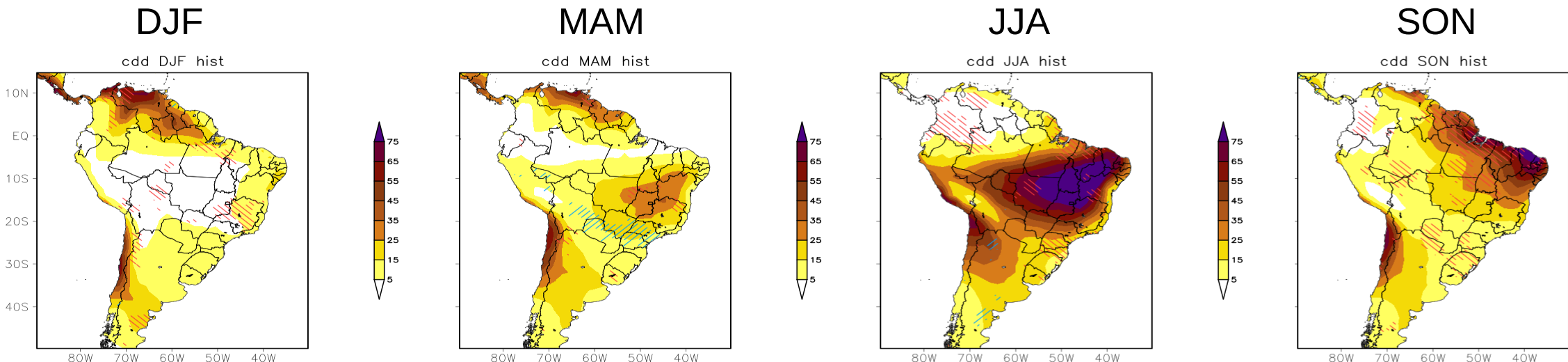
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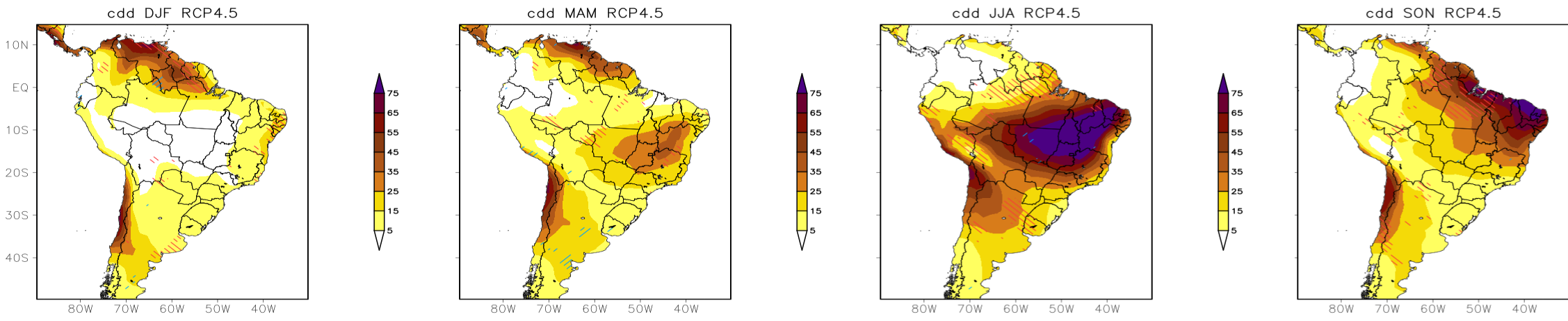
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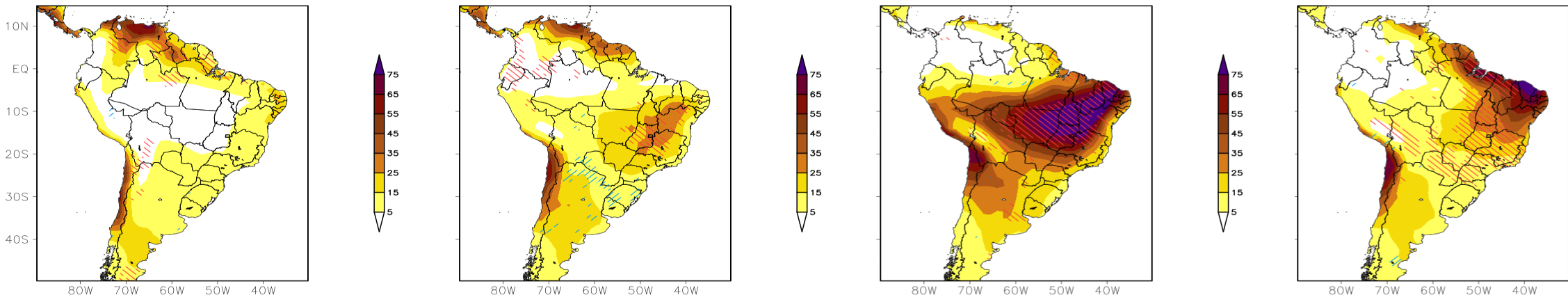
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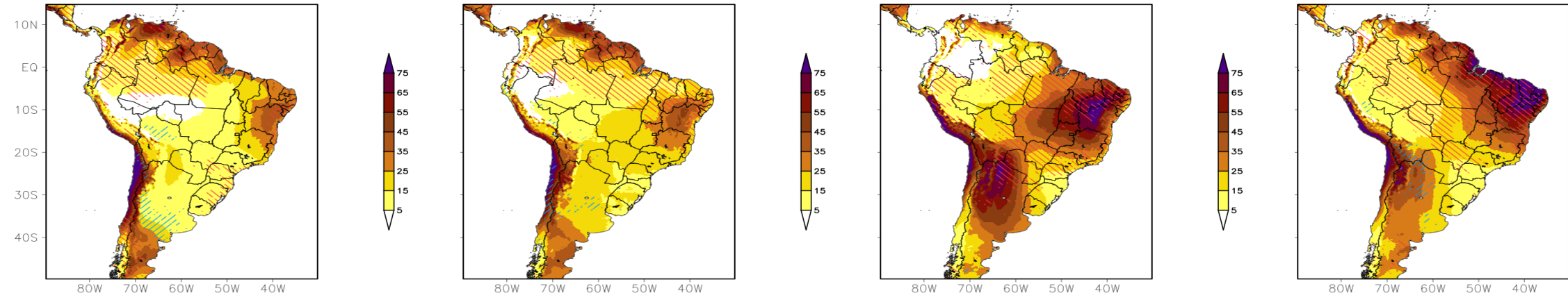
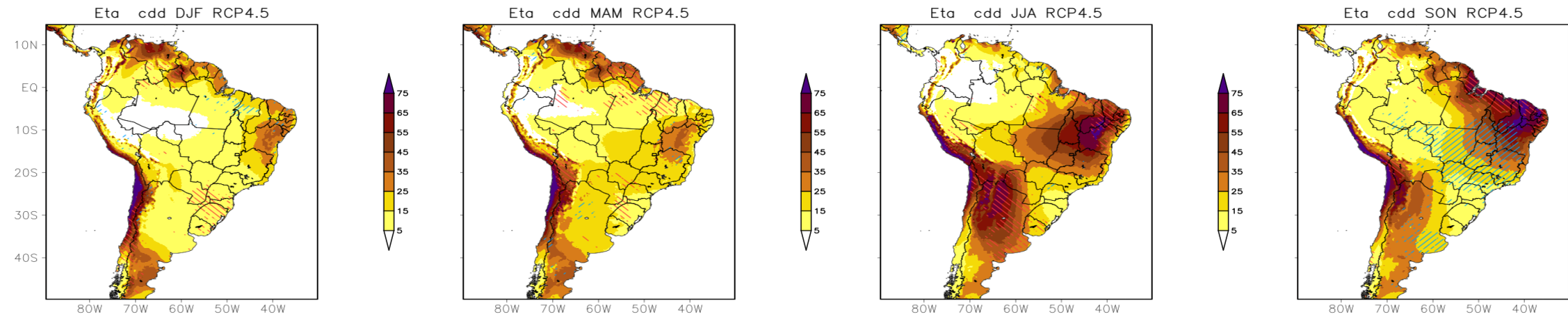
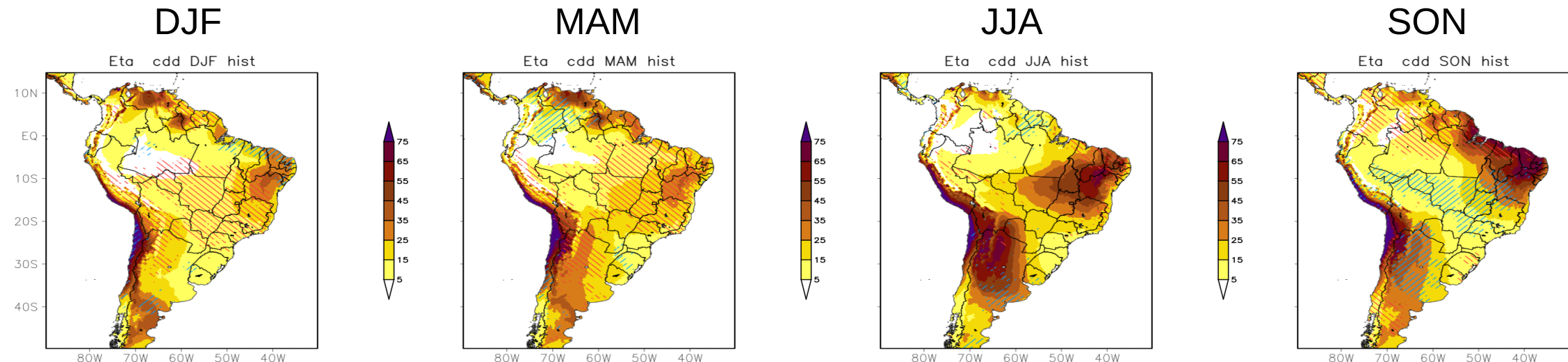
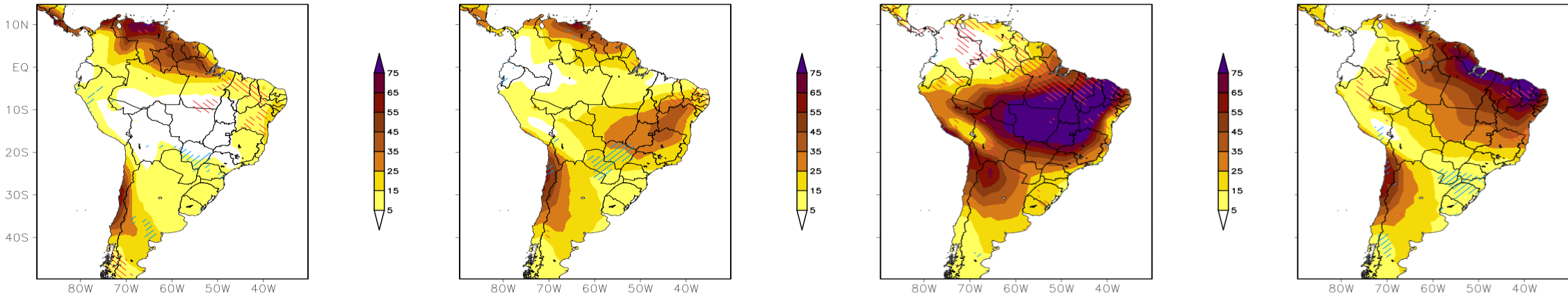
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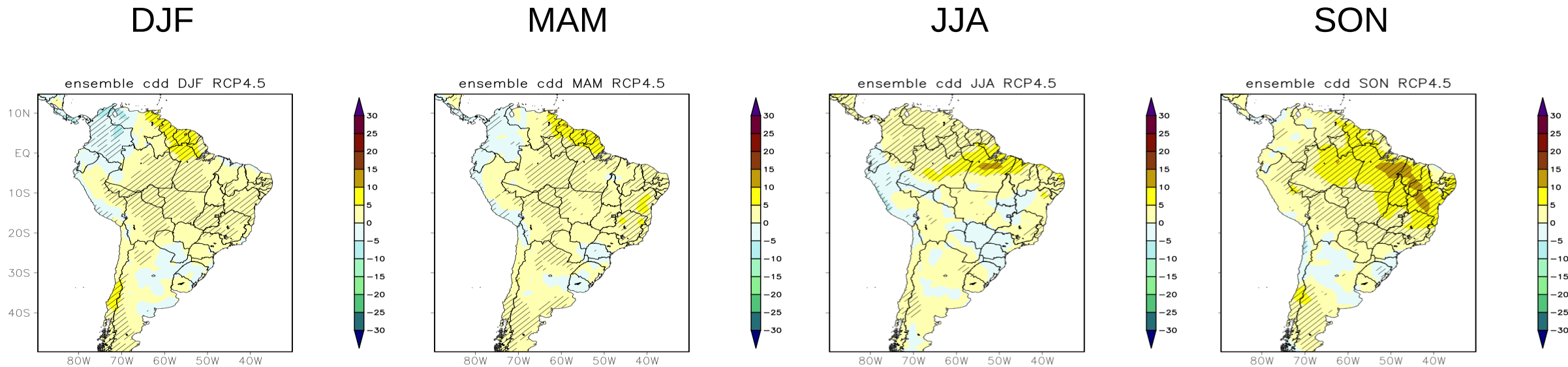
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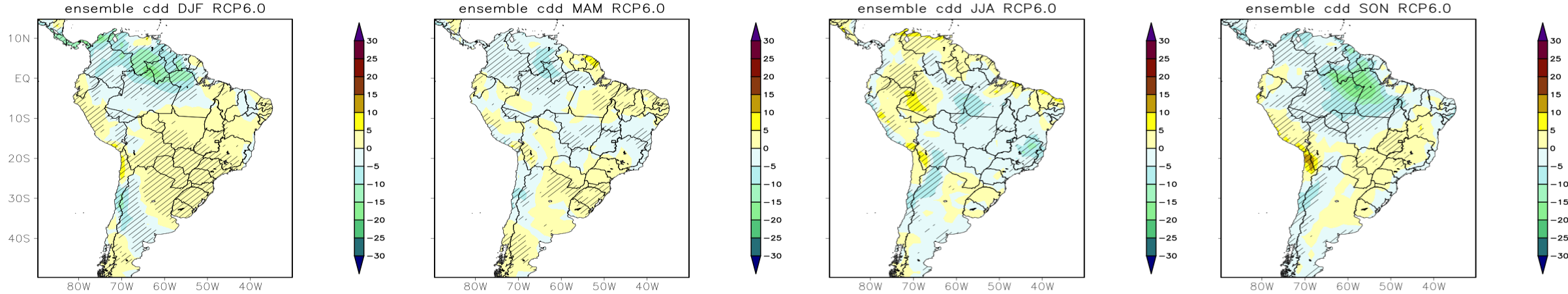
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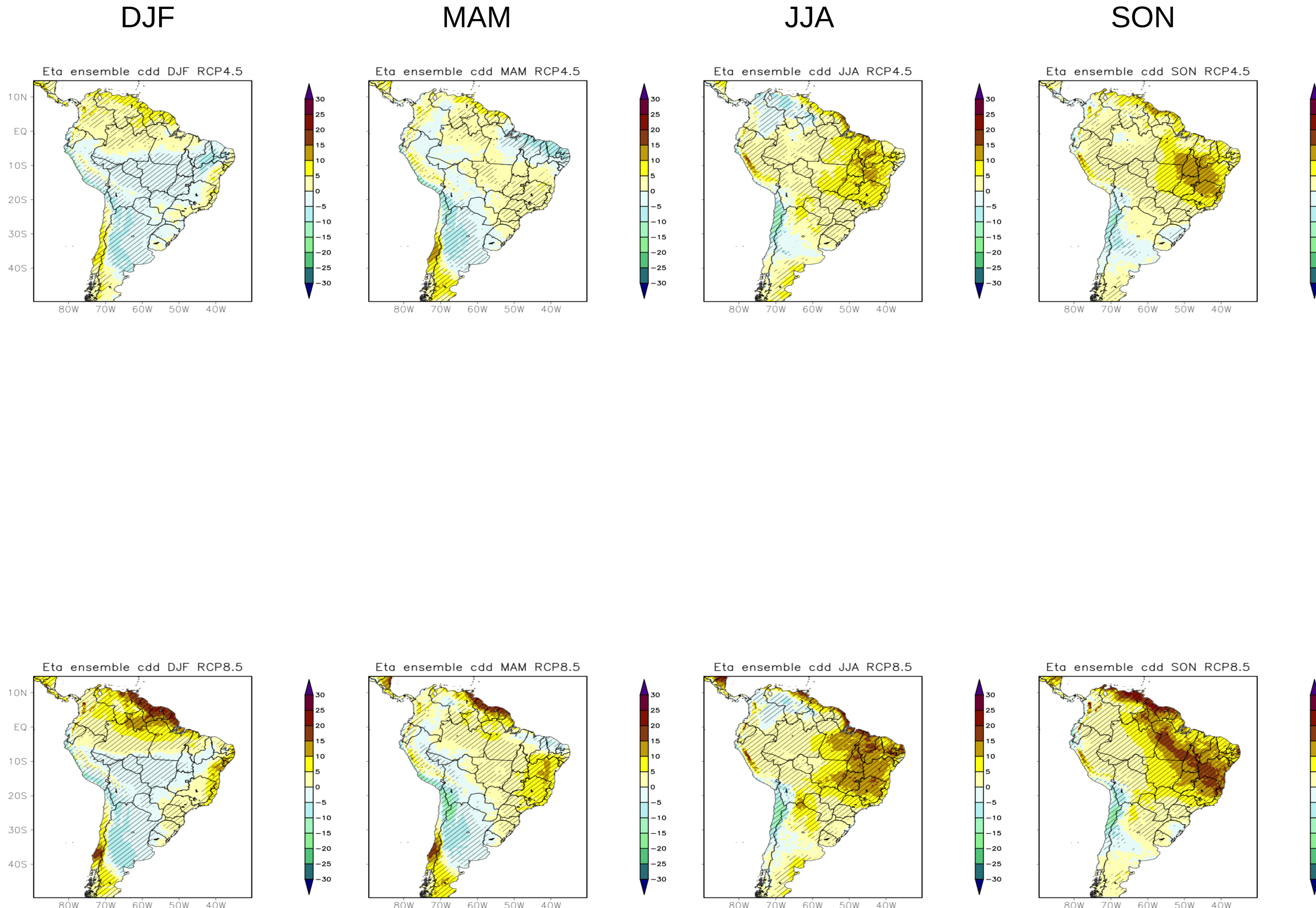
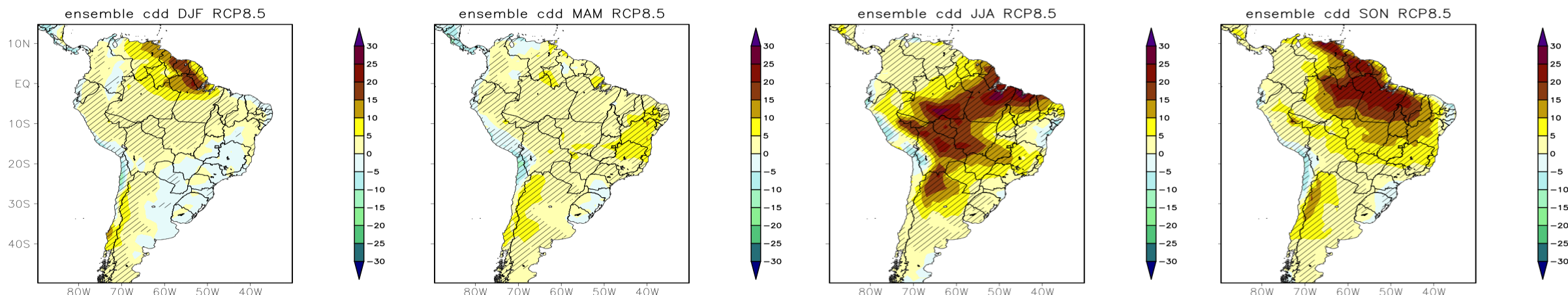
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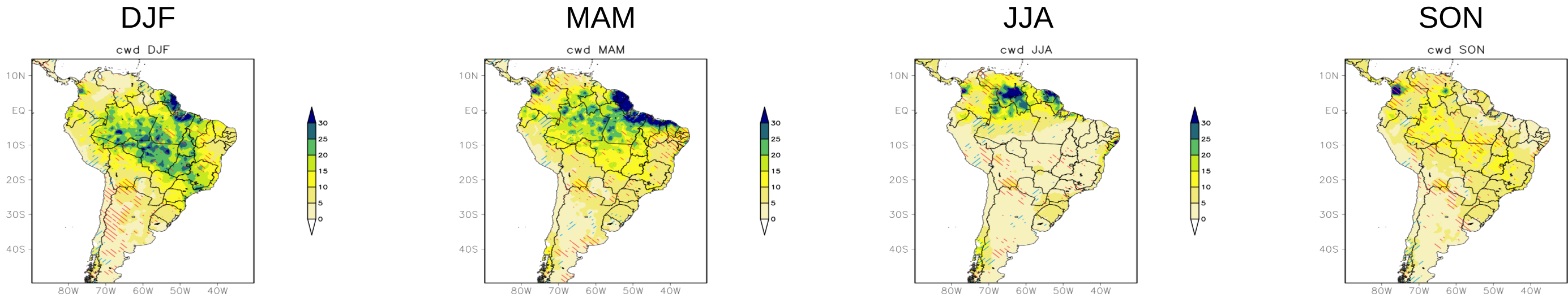


RCP8.5



CWD - Maior sequência de dias úmidos consecutivos (dias)

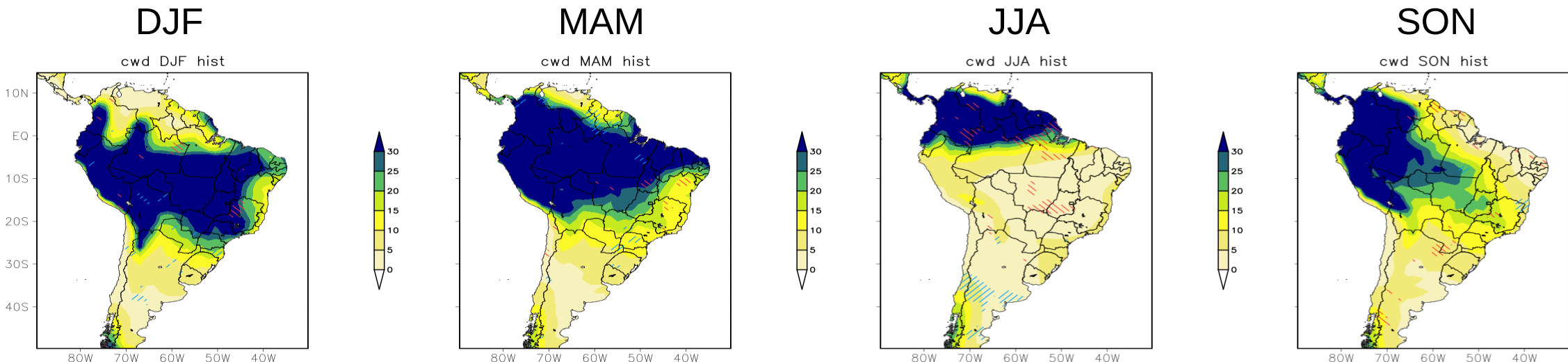
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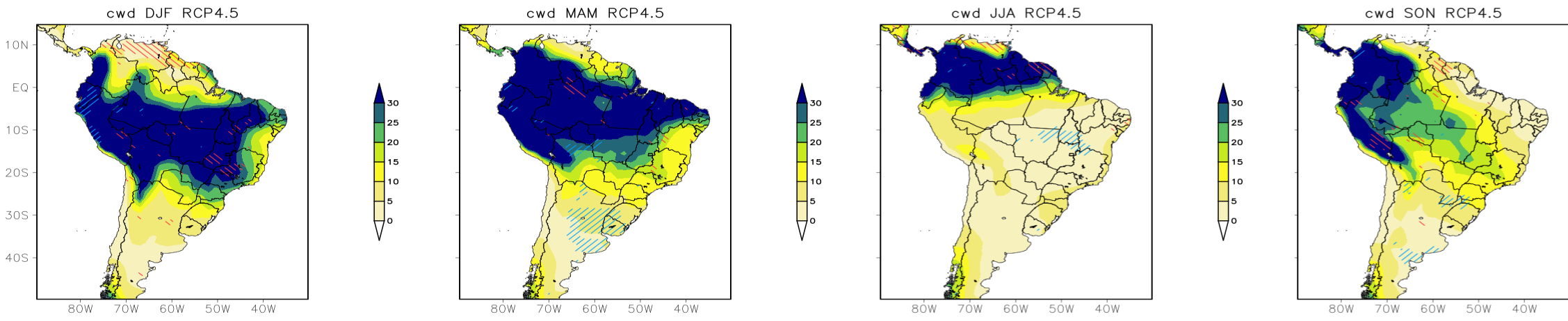
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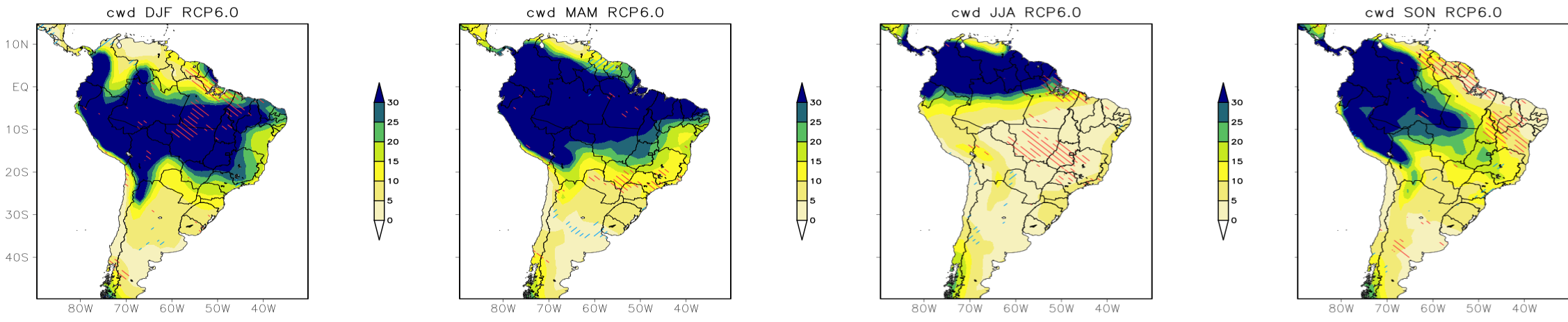
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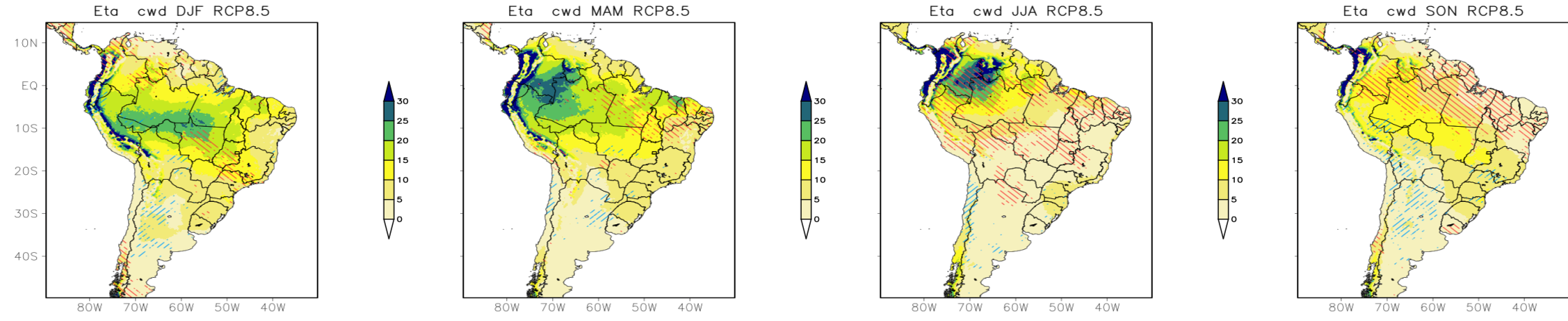
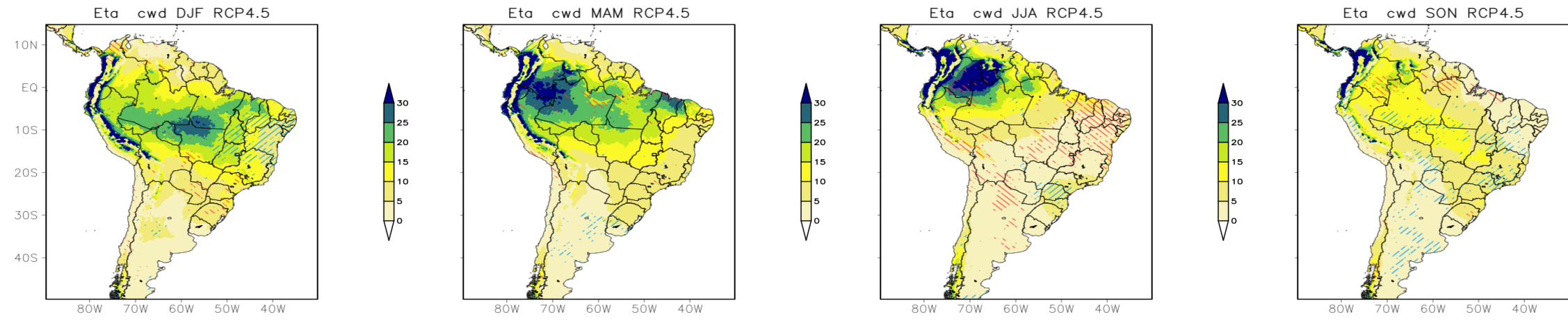
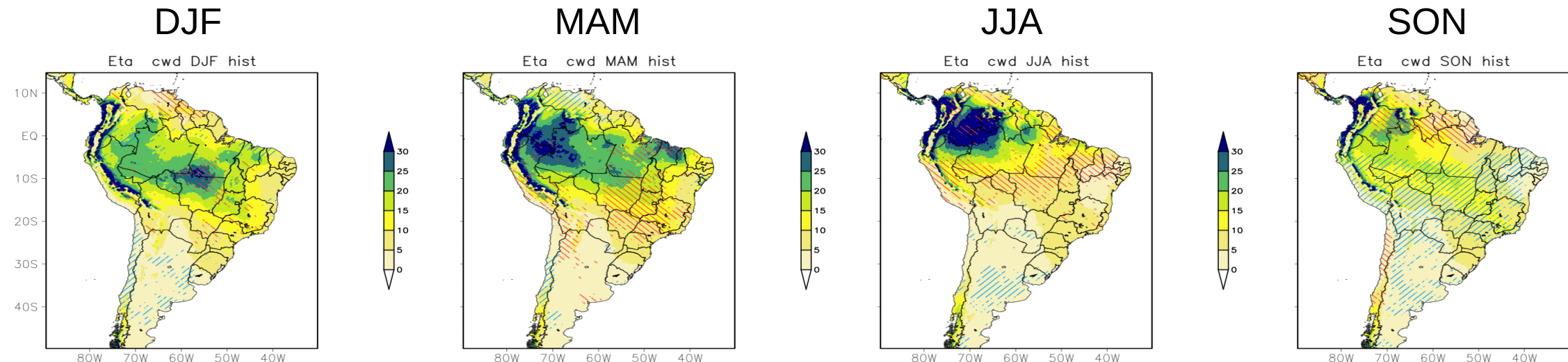
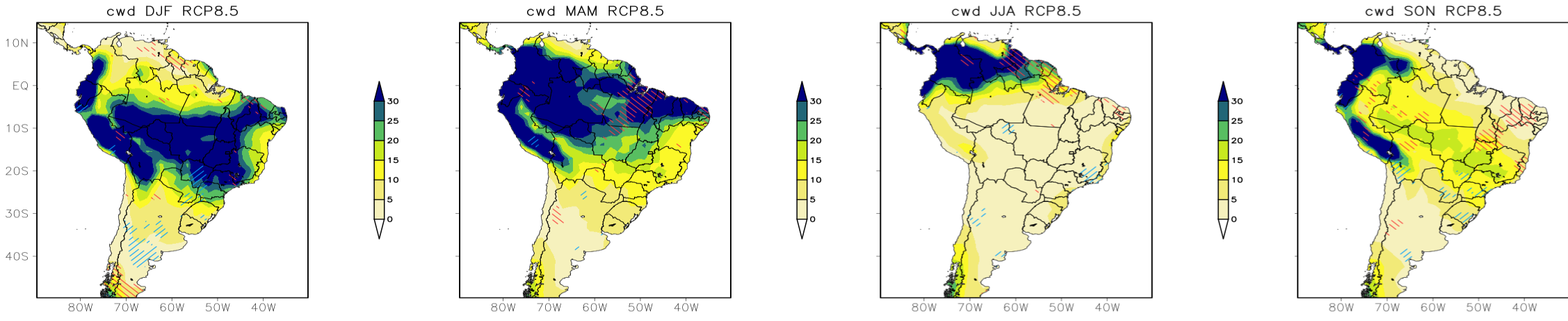
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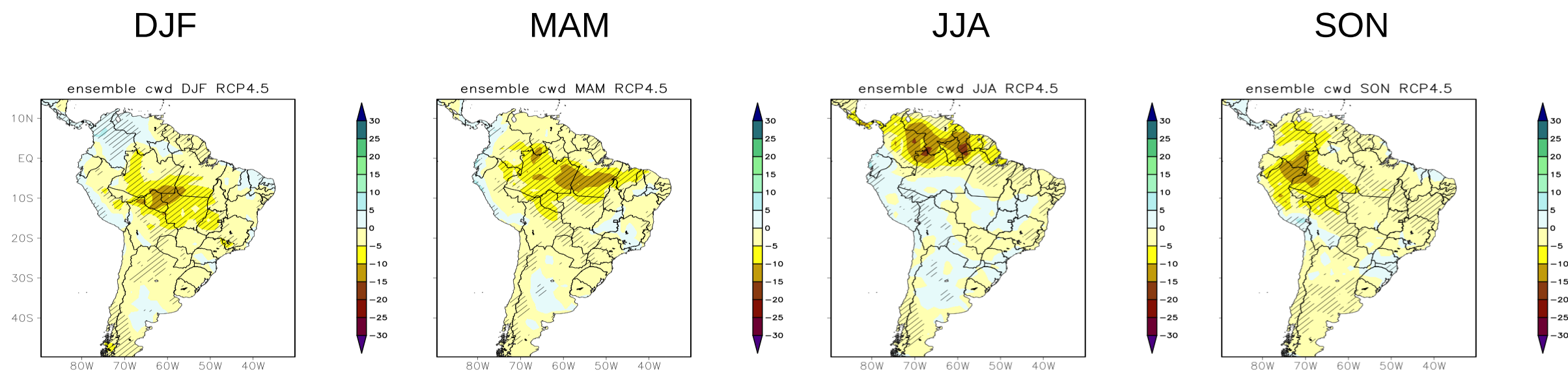
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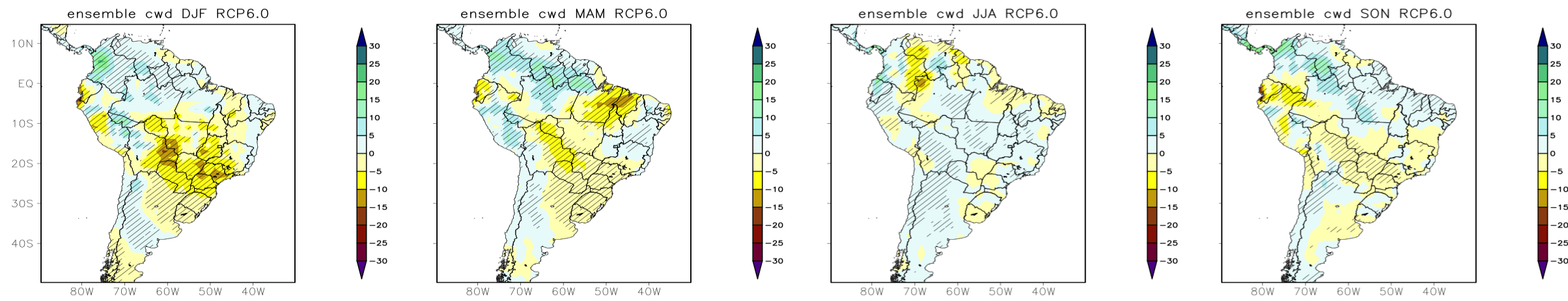
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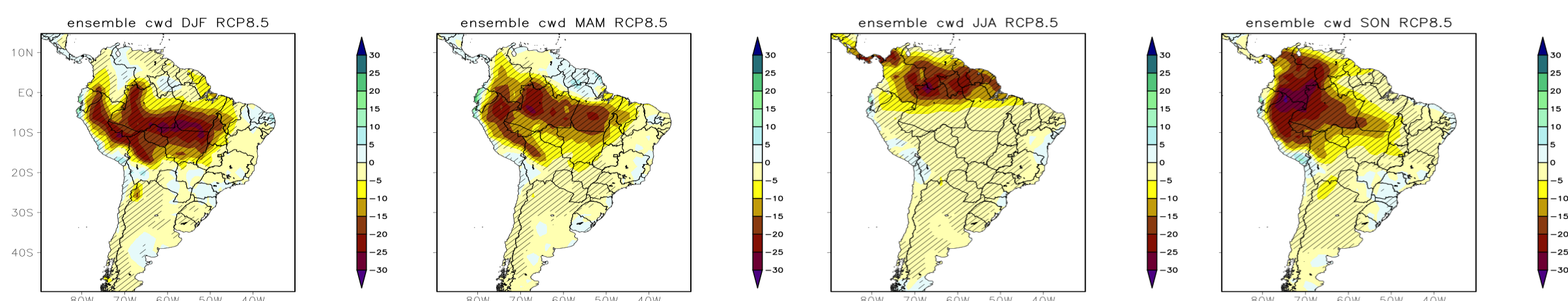
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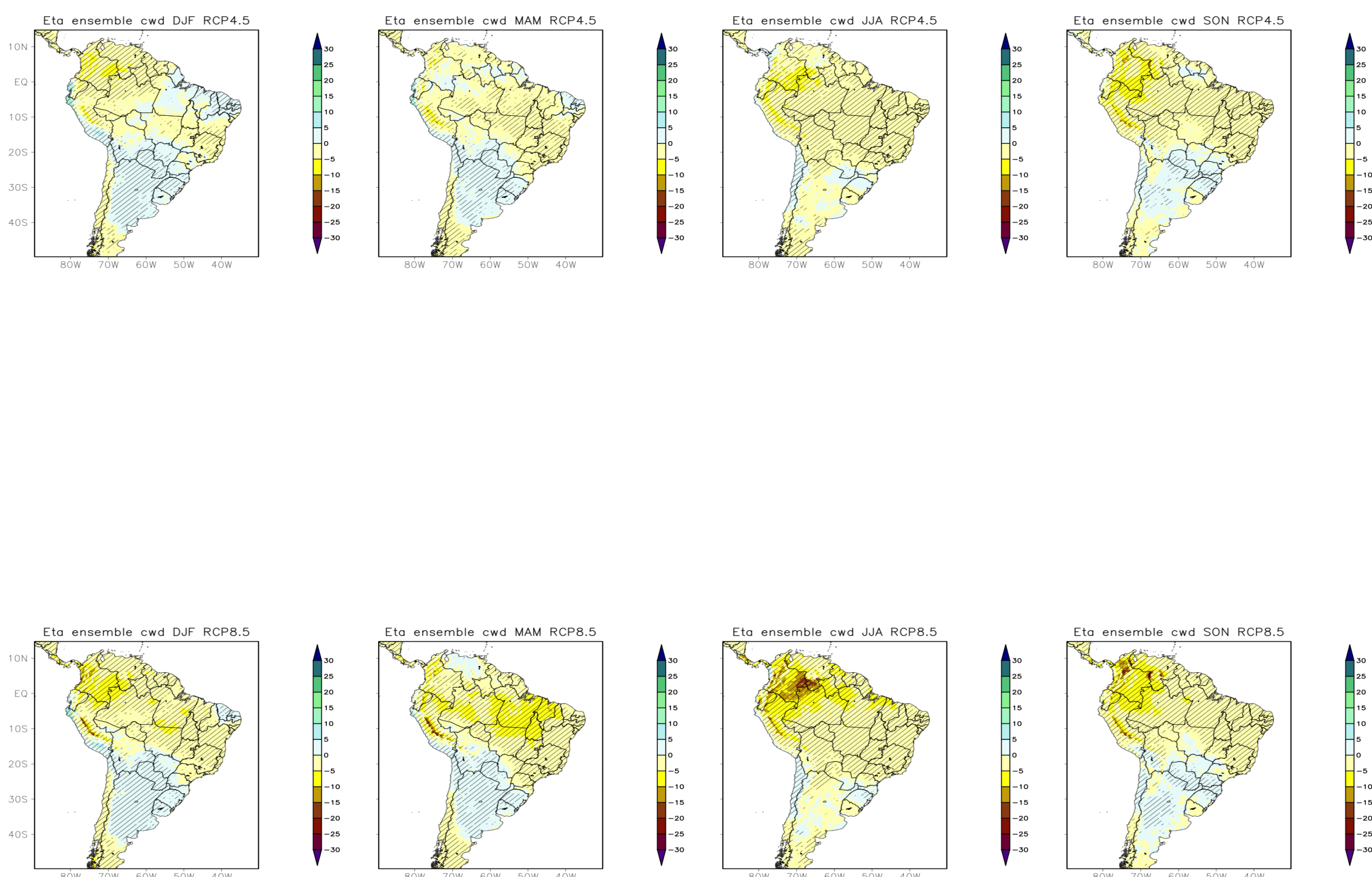


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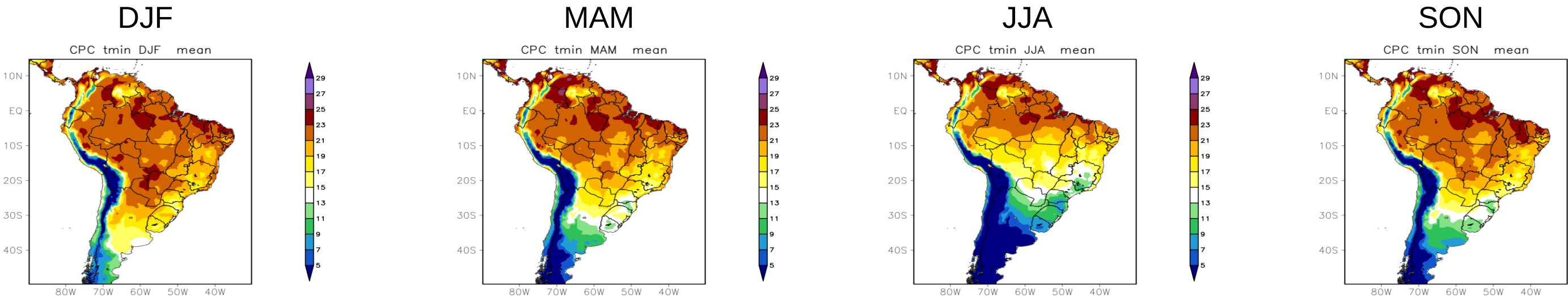
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JJA

SON



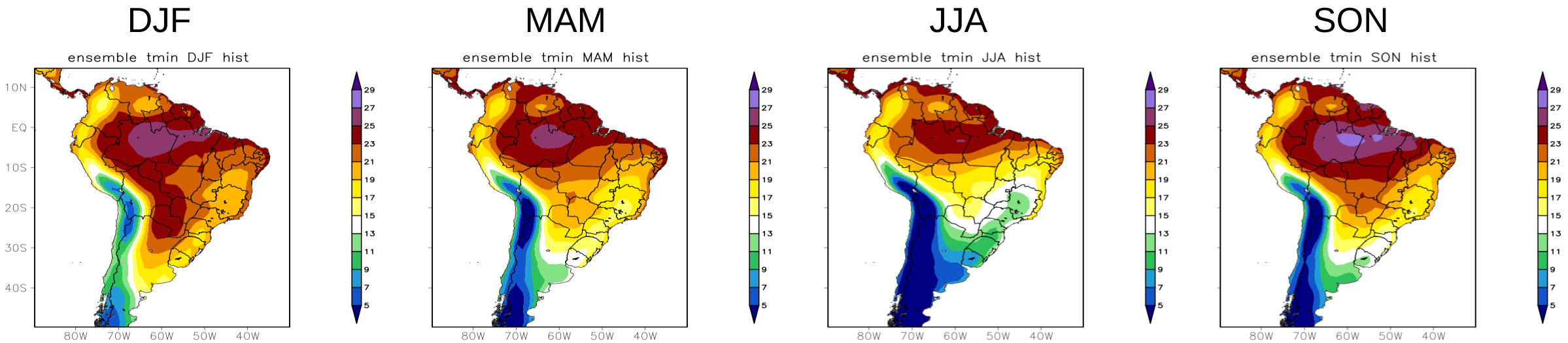
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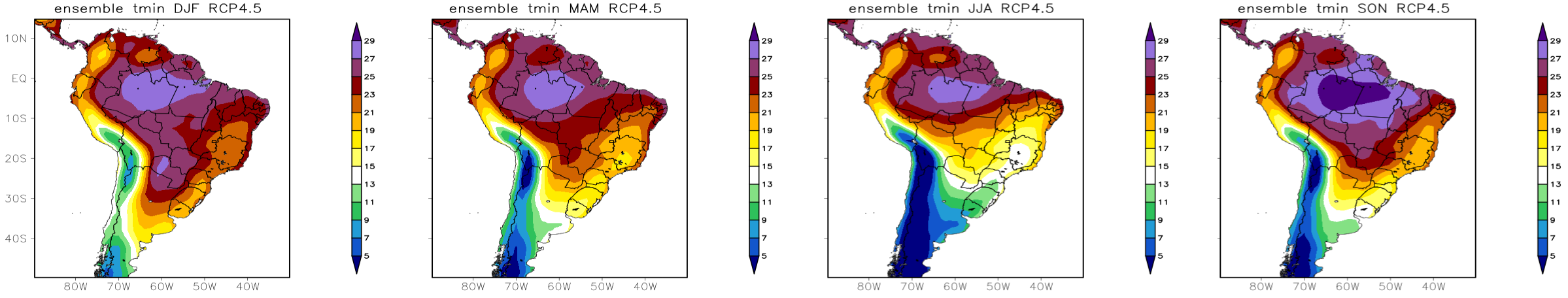
GCMs

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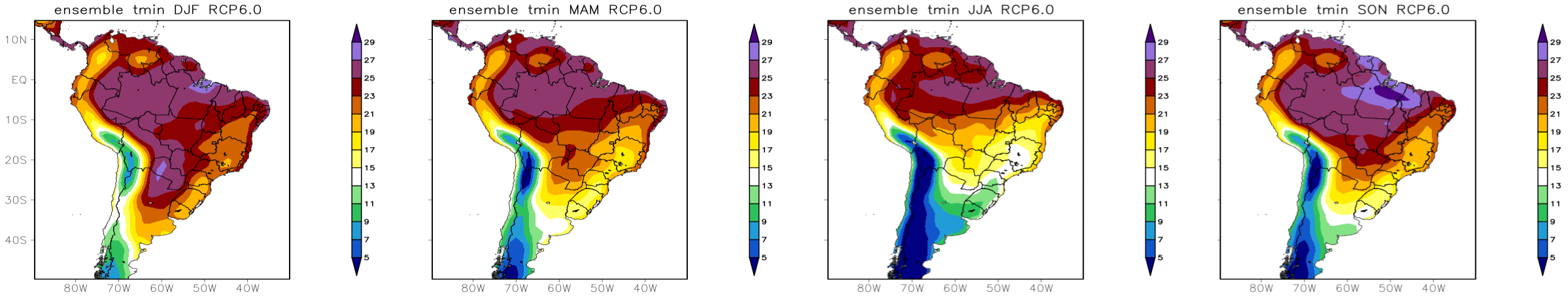
Historical



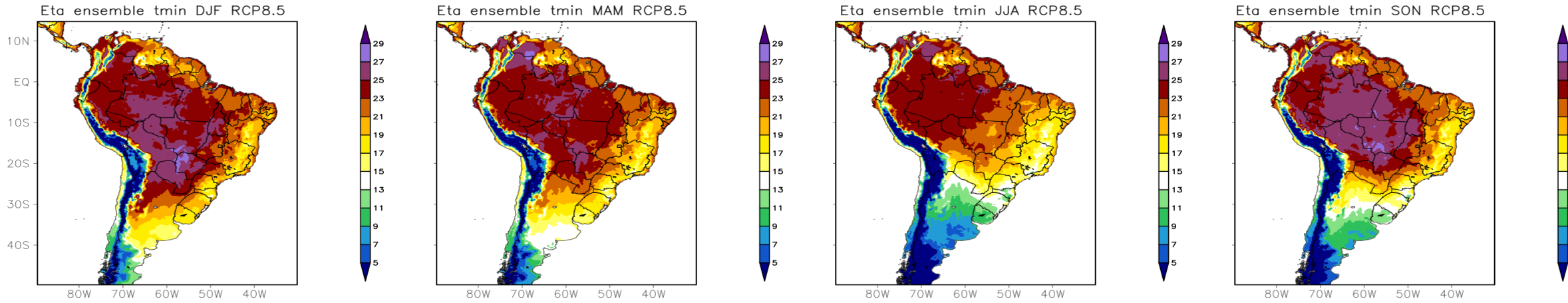
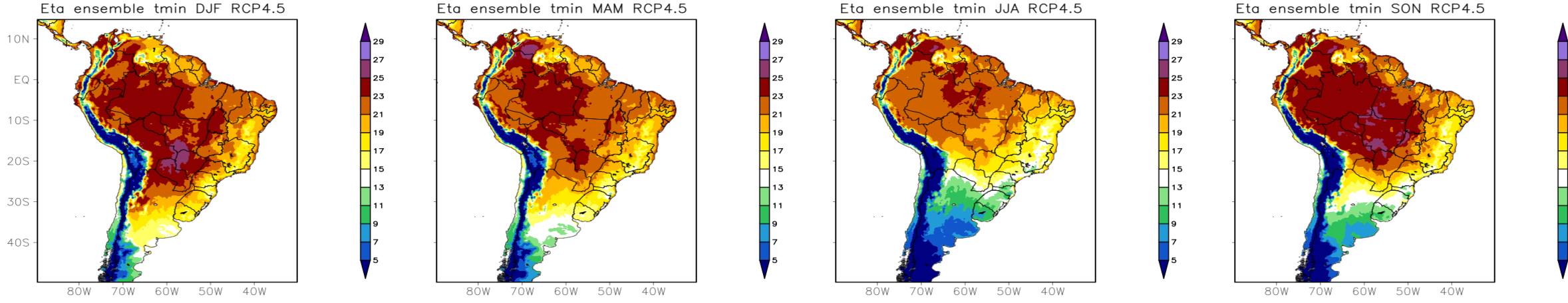
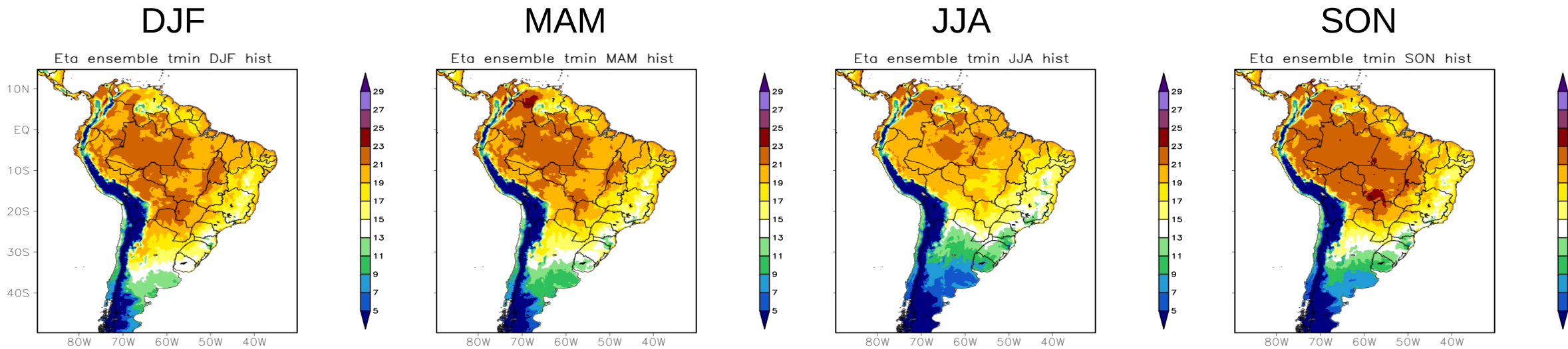
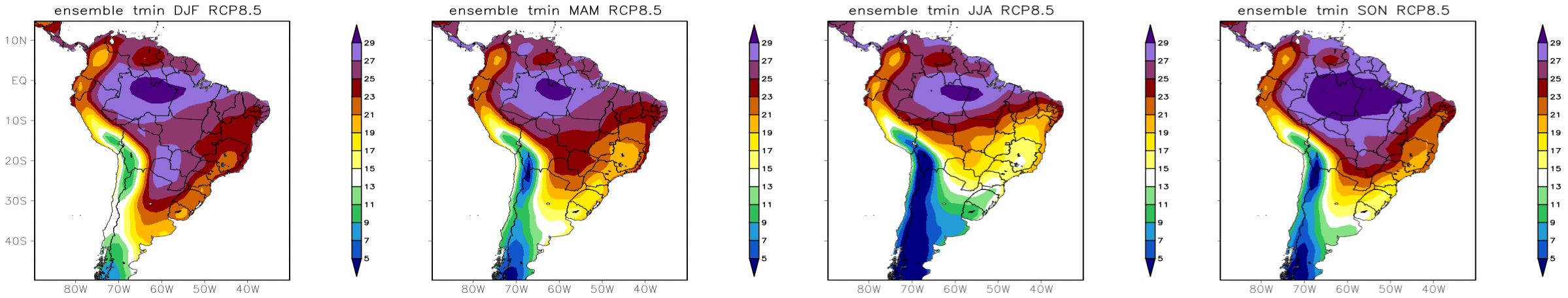
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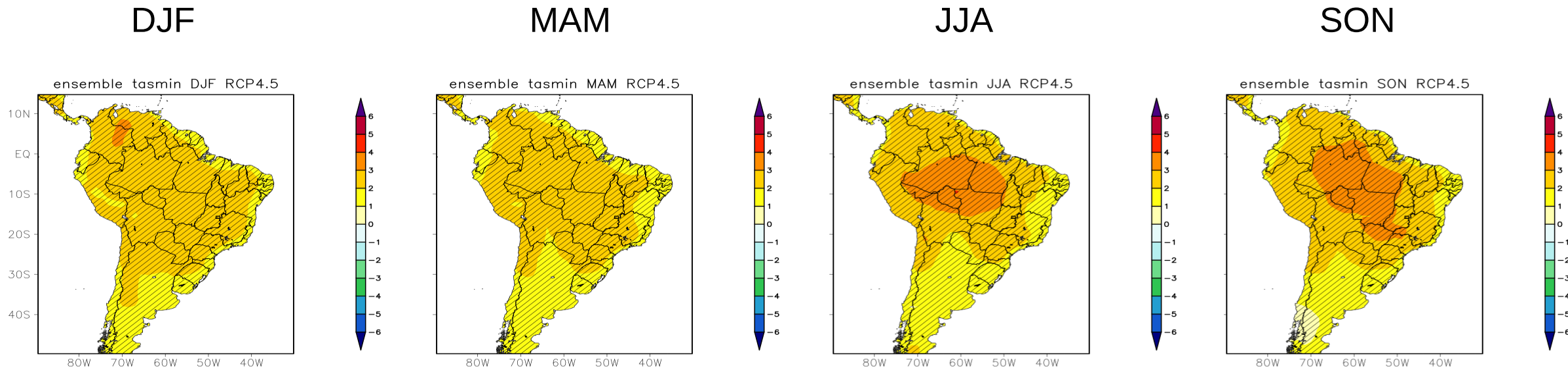
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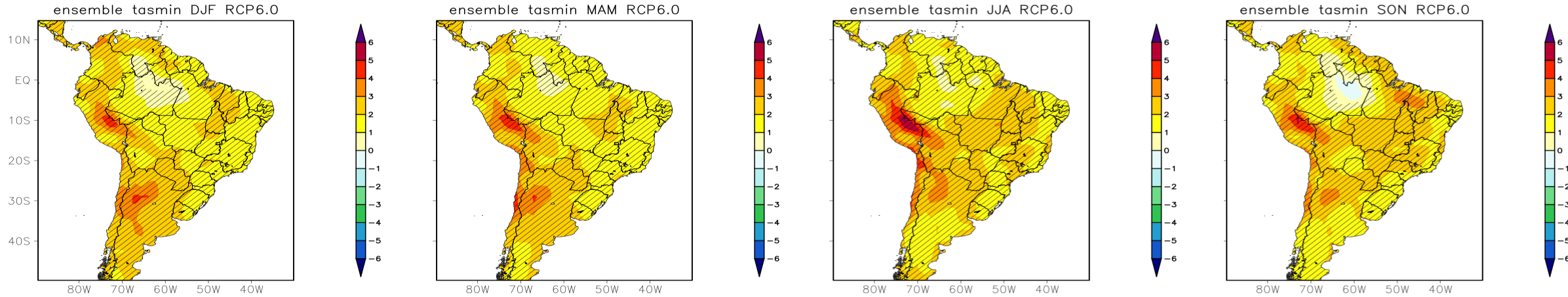
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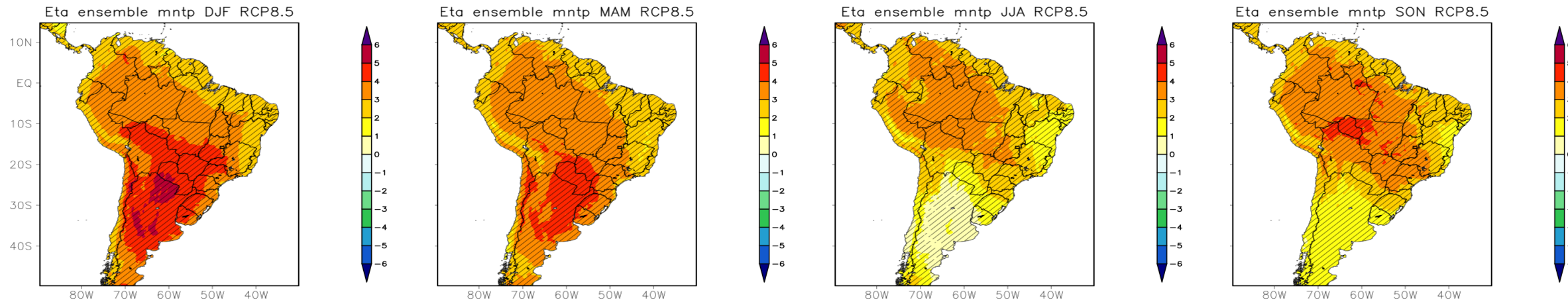
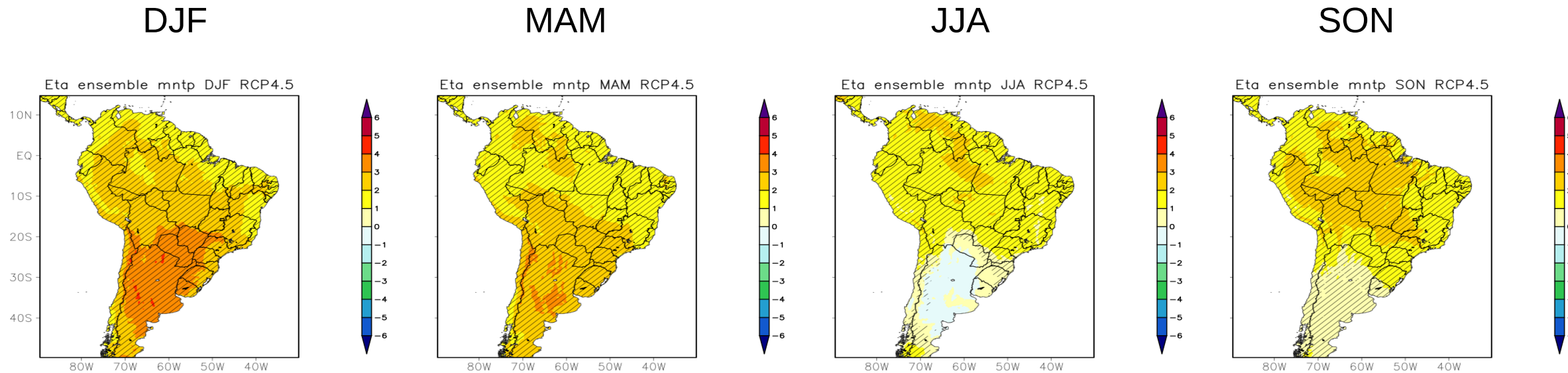
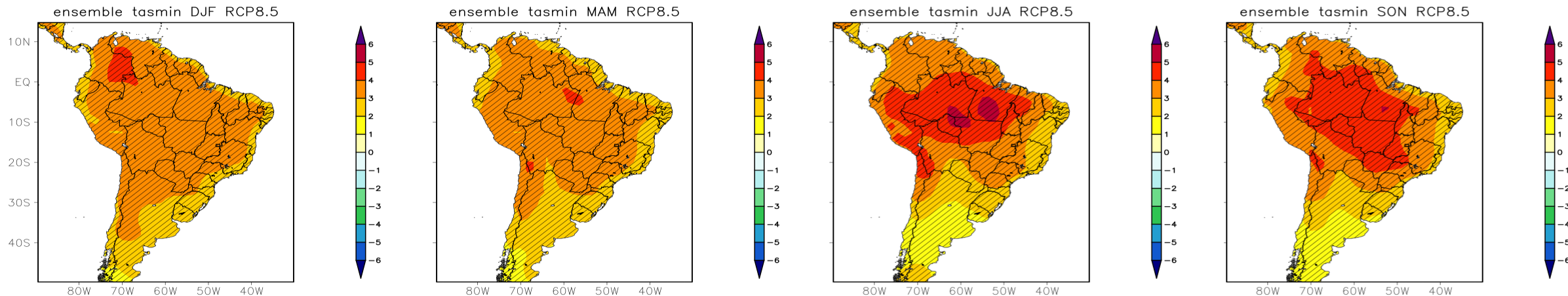
RCP4.5



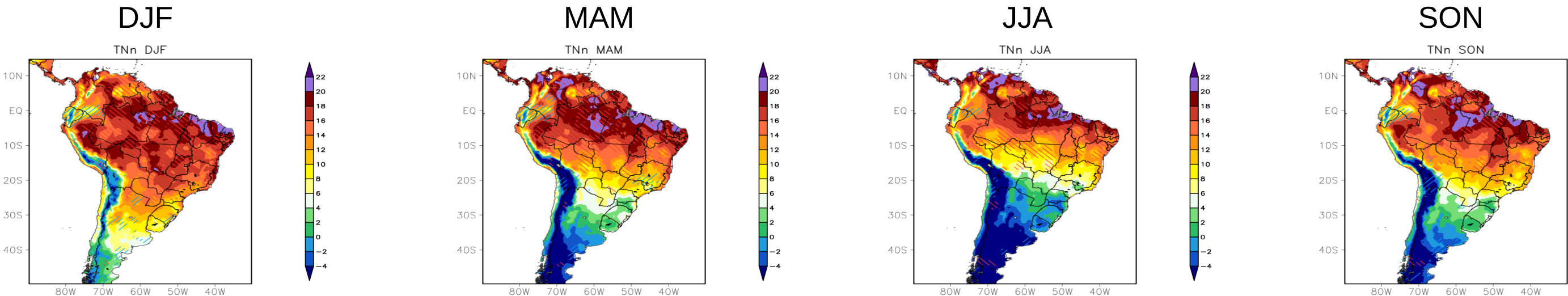
RCP6.0



RCP8.5



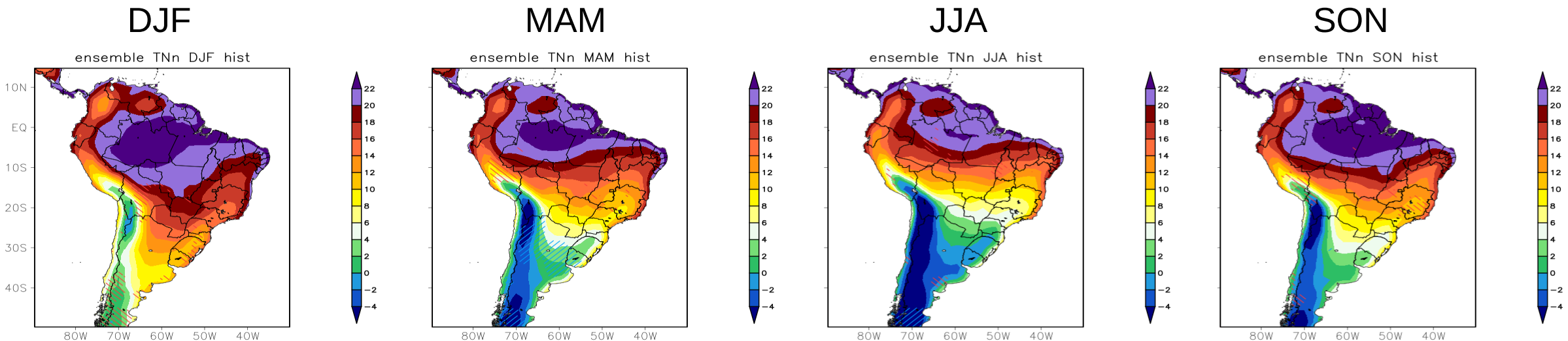
CPC



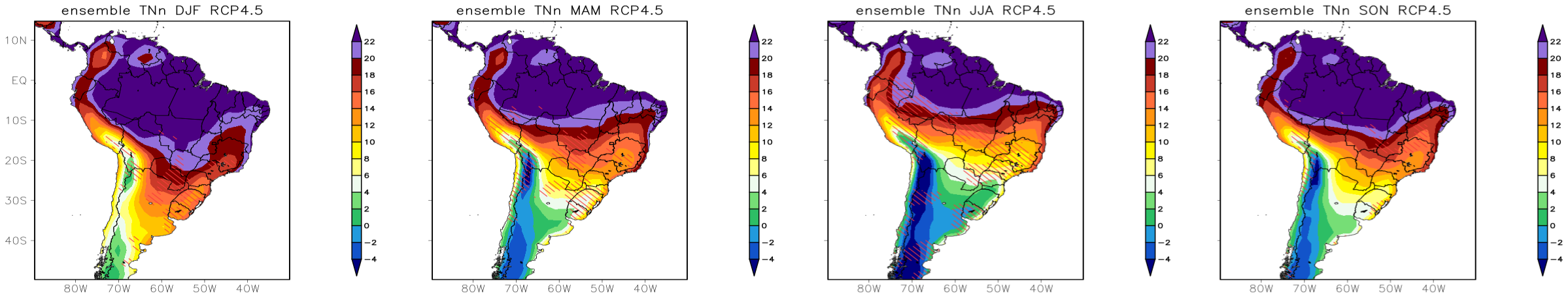
GCMs

ETA

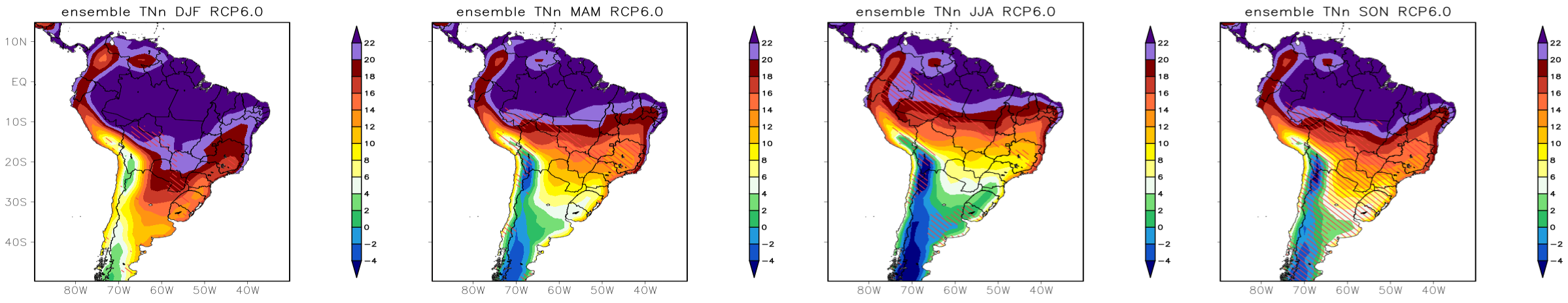
Historical



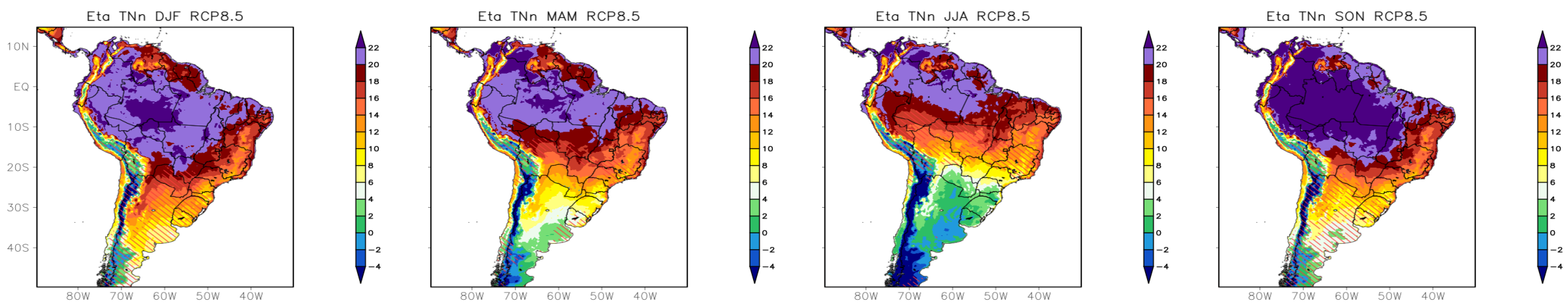
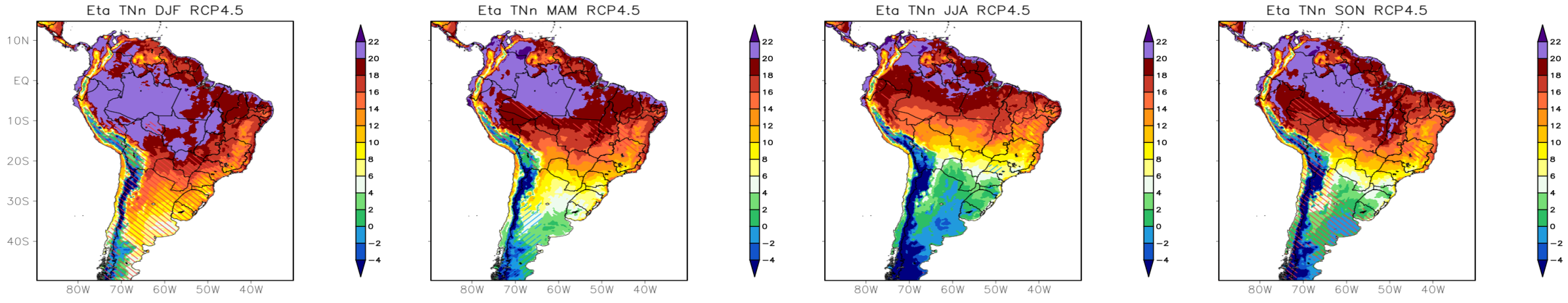
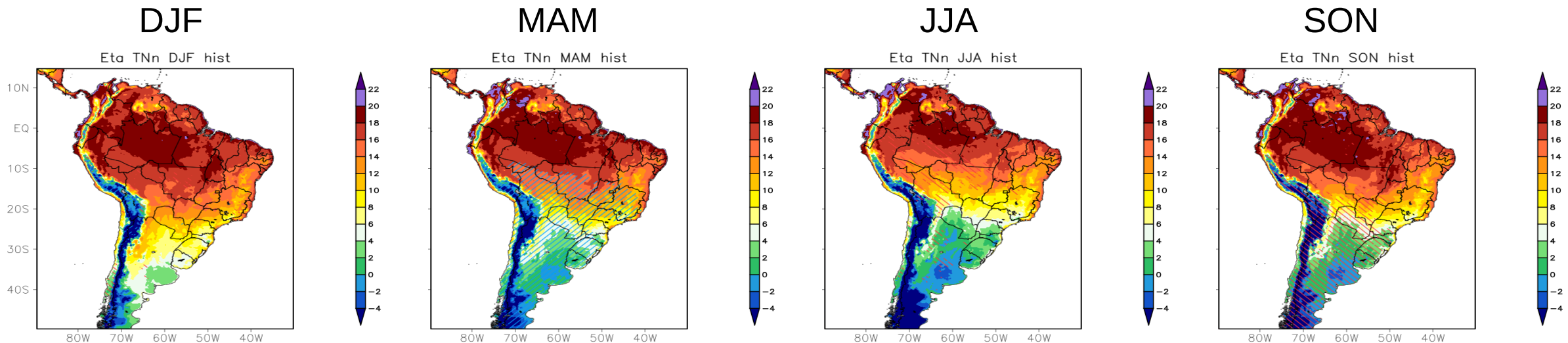
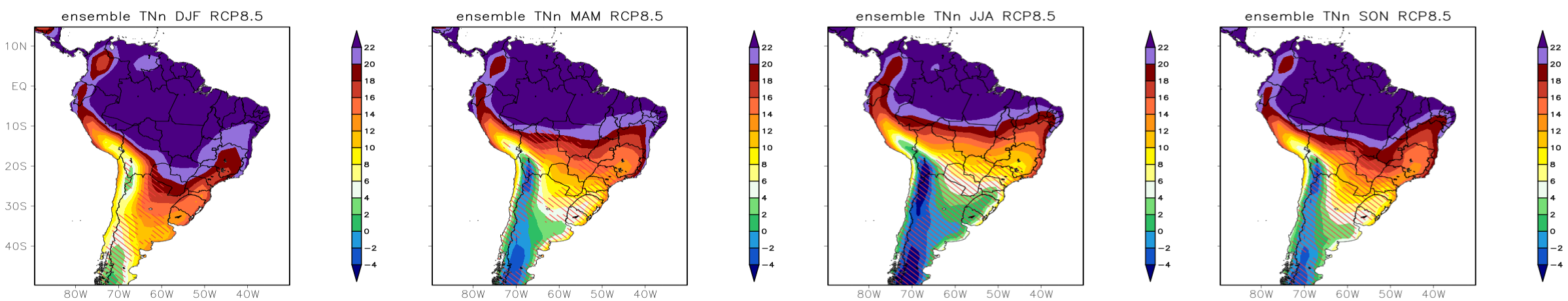
RCP4.5



RCP6.0



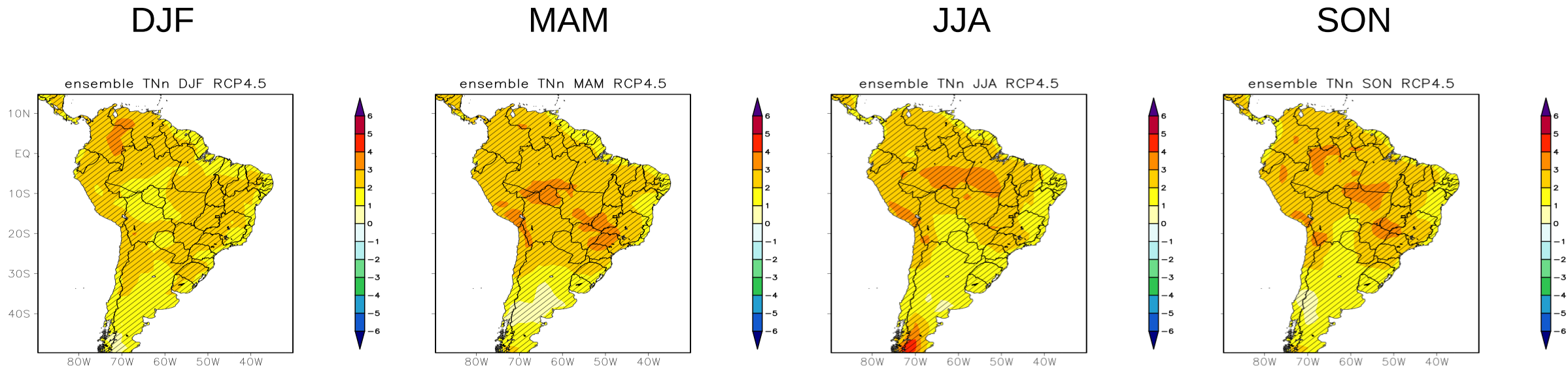
RCP8.5



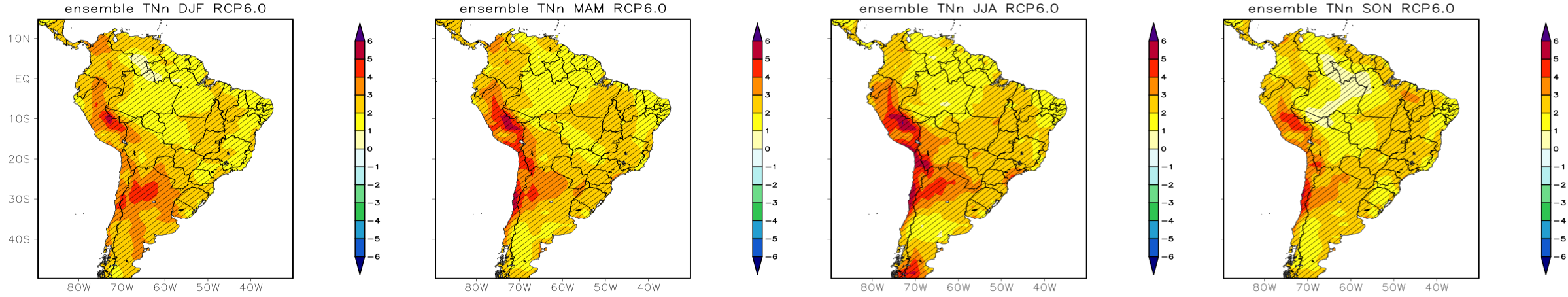
GCMs

ETA

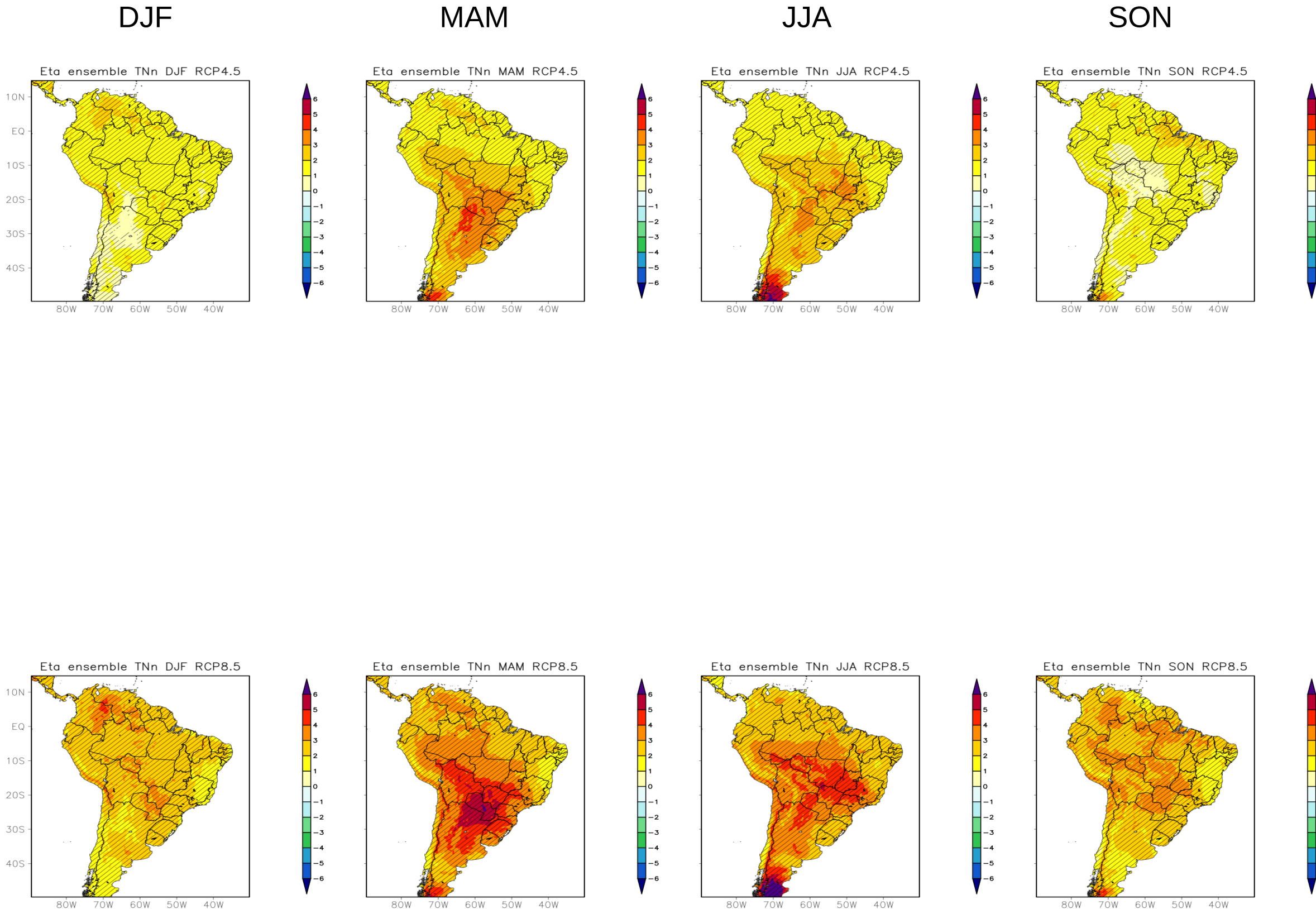
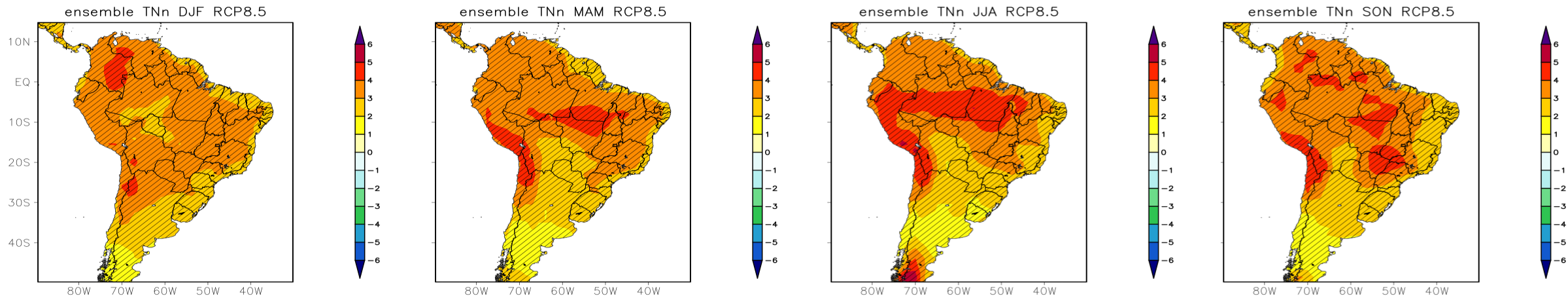
RCP4.5



RCP6.0

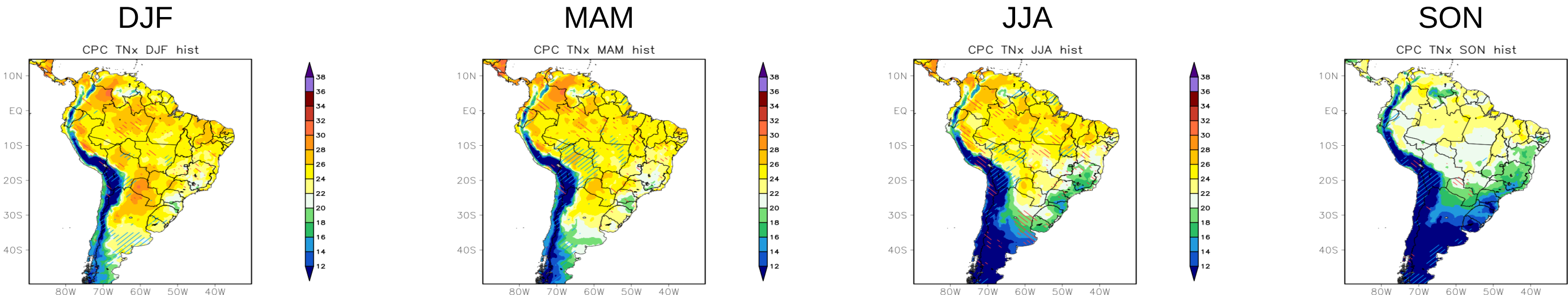


RCP8.5



TNx - Valor máximo diário da TN dentro de um período (°C)

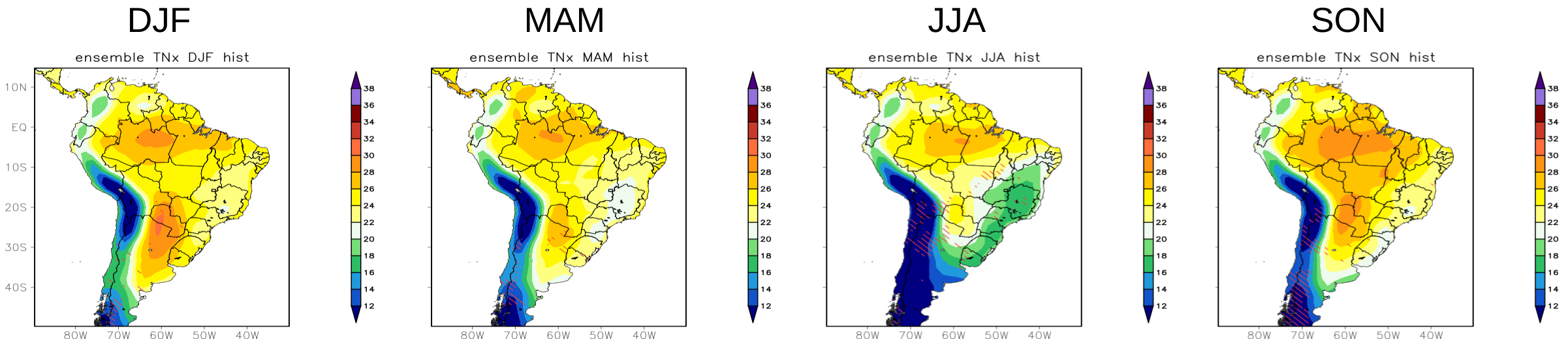
CPC



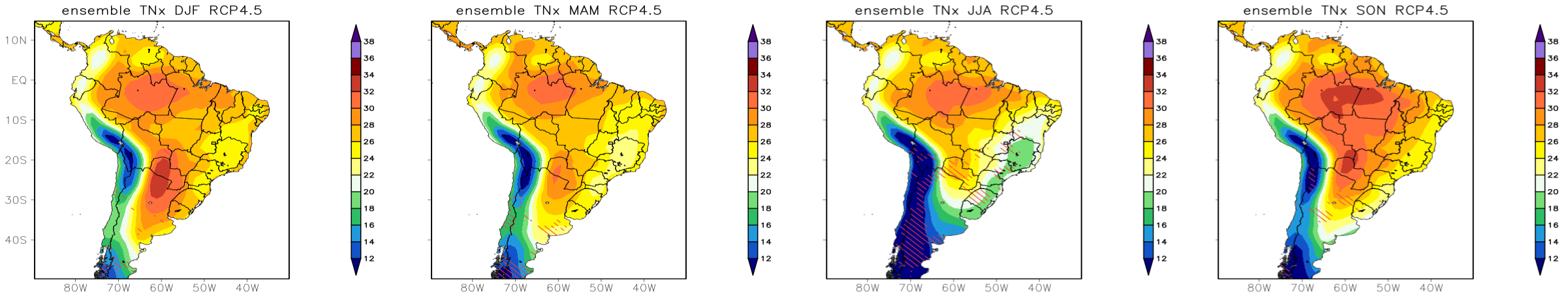
GCMs

ETA

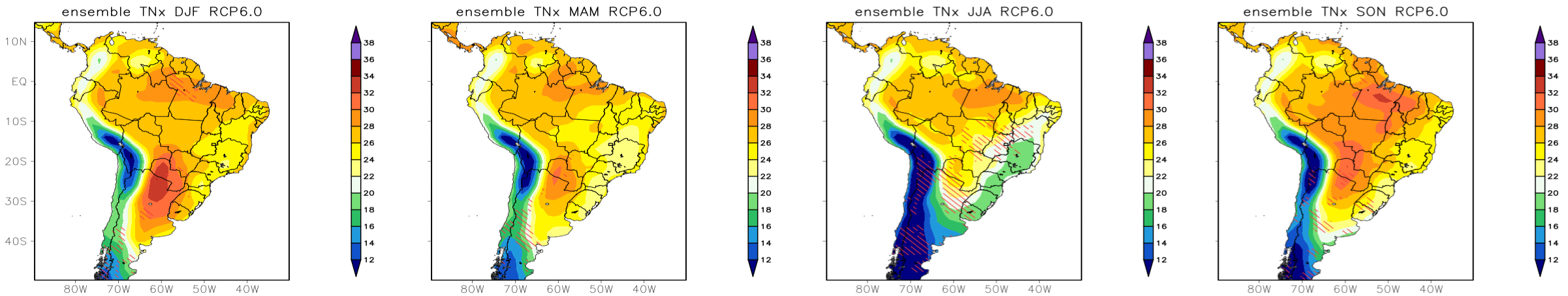
Historical



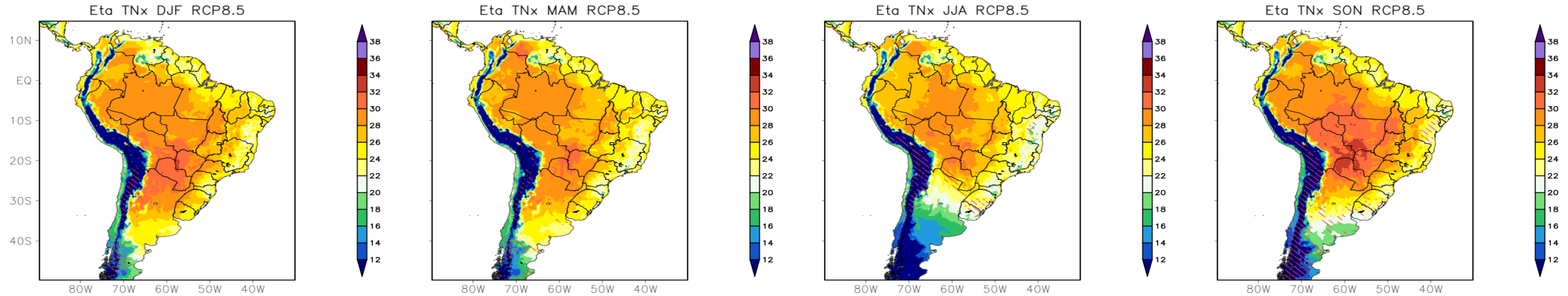
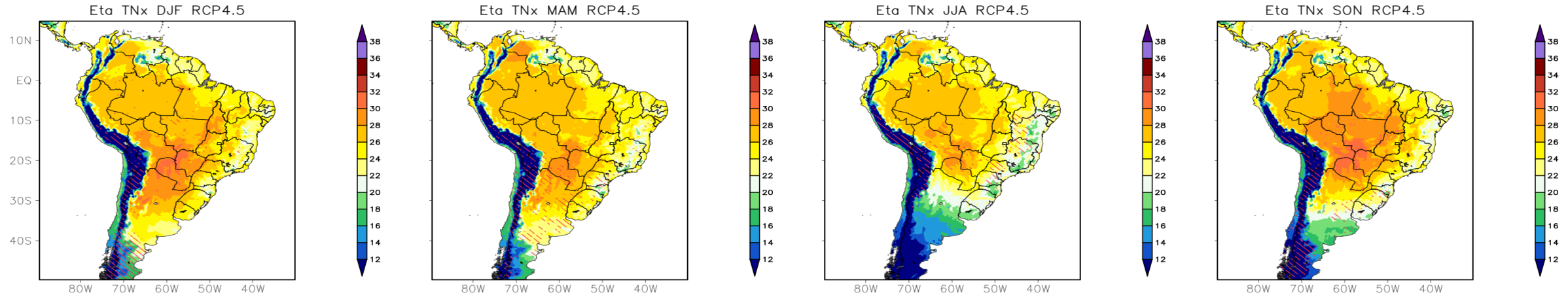
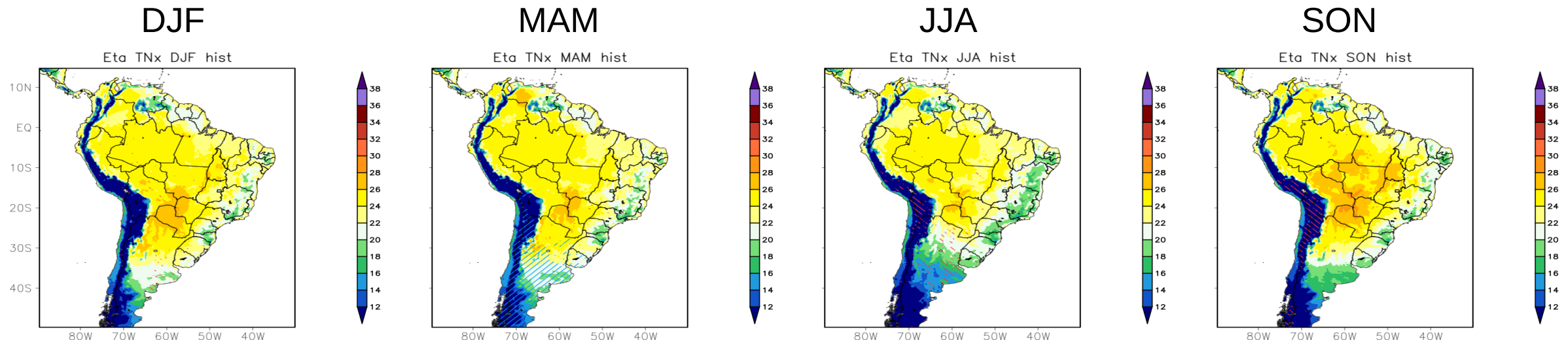
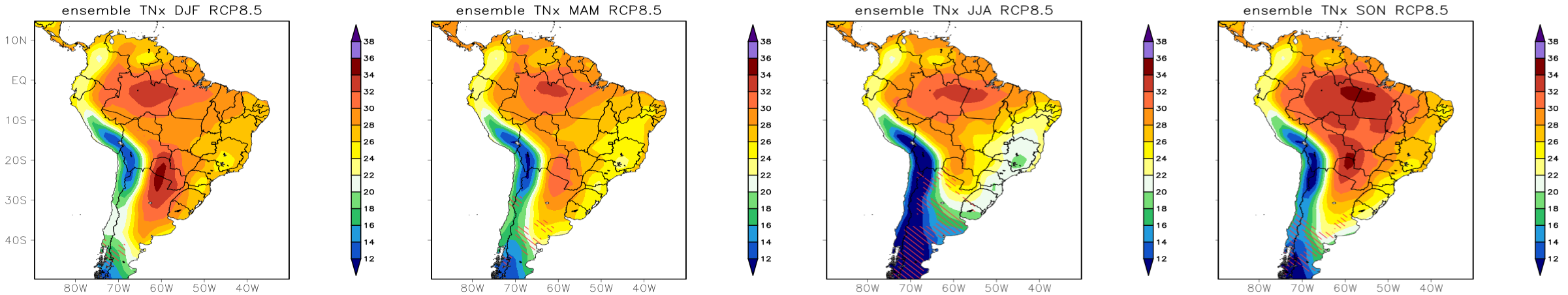
RCP4.5



RCP6.0



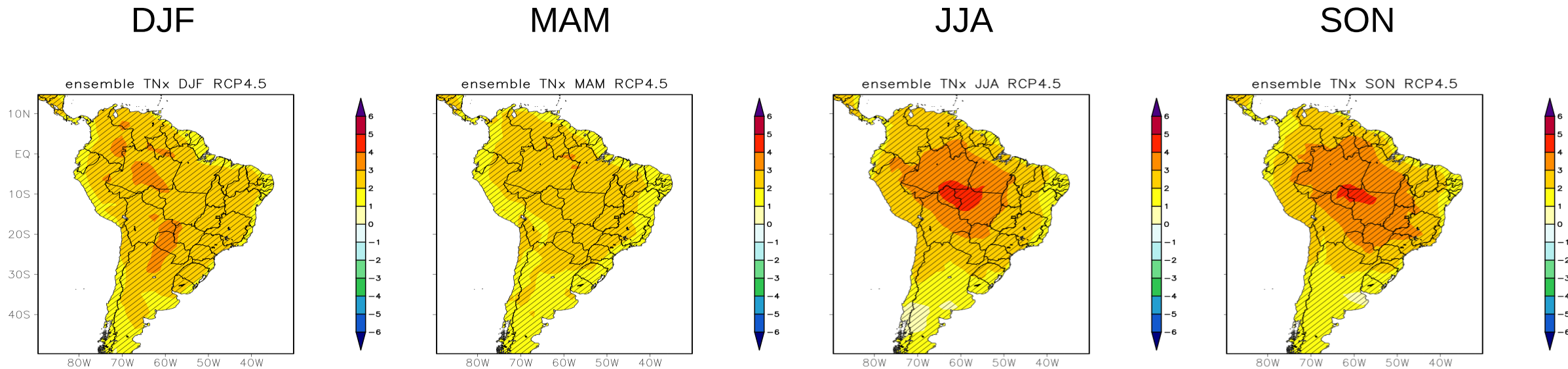
RCP8.5



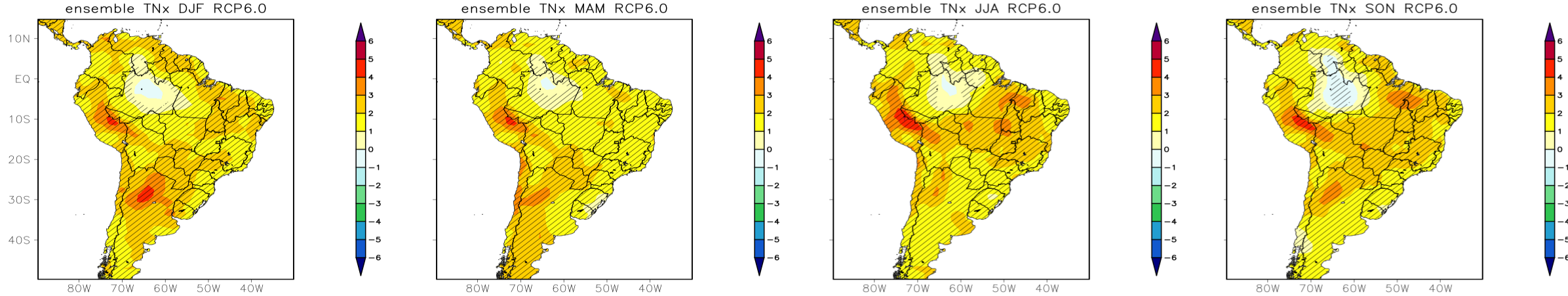
GCMs

ETA

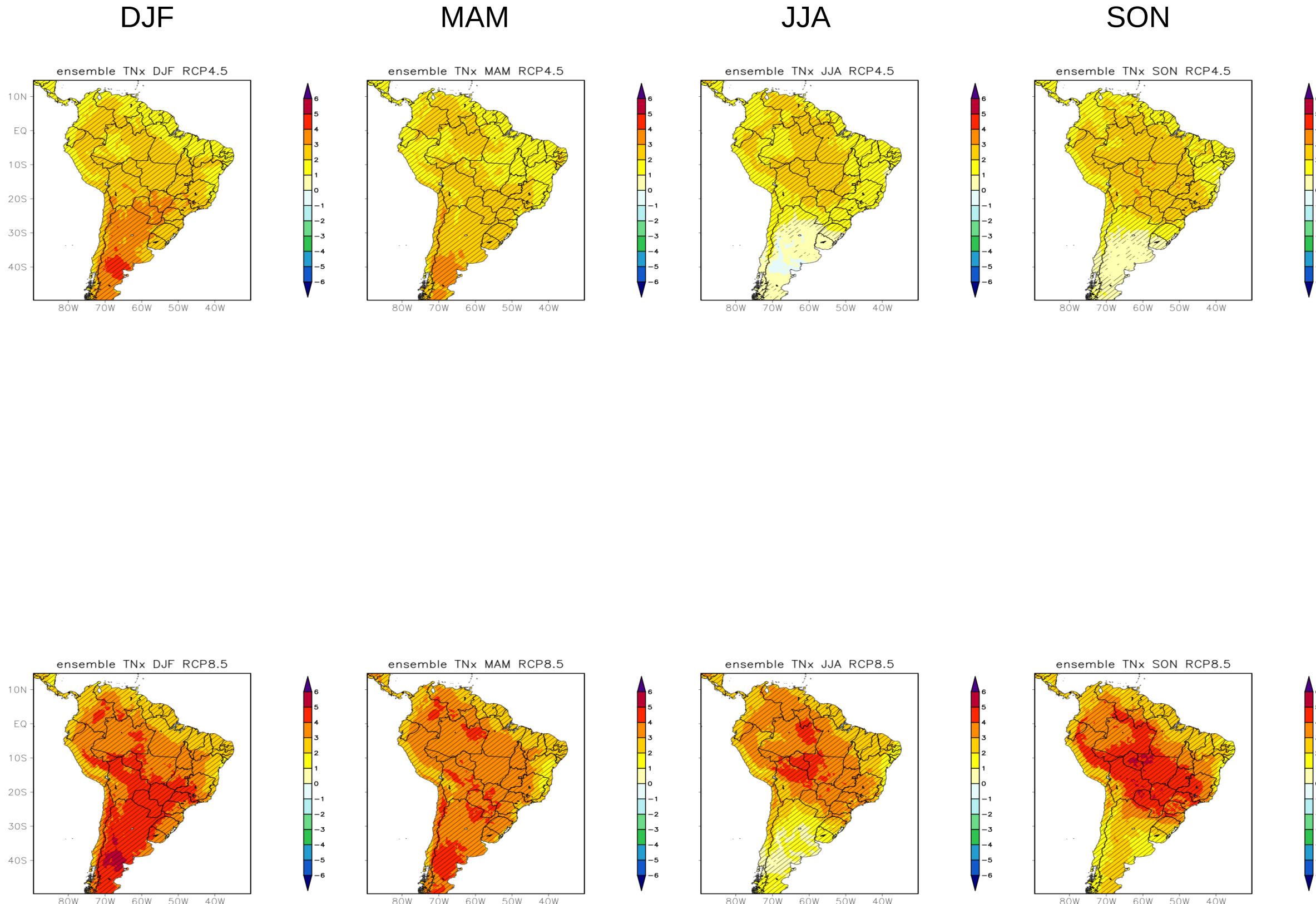
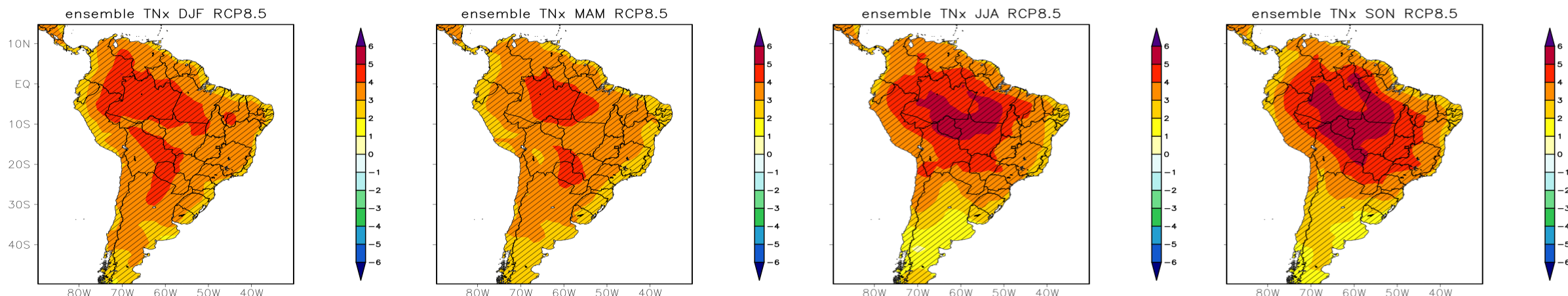
RCP4.5



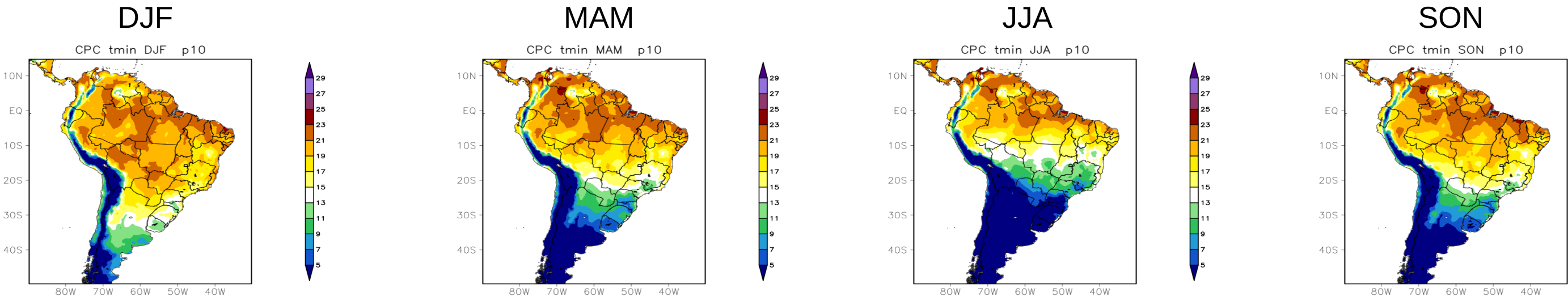
RCP6.0



RCP8.5

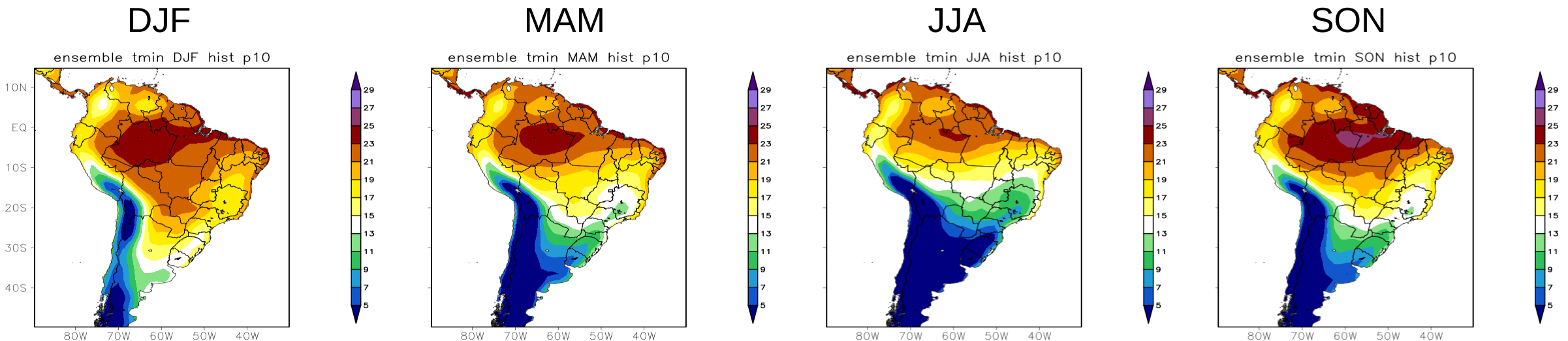


CPC

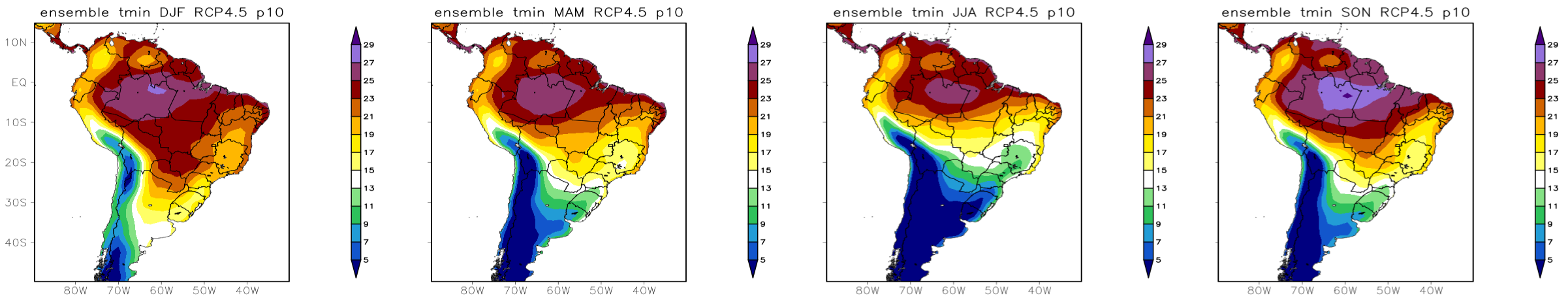


GCMs ETA

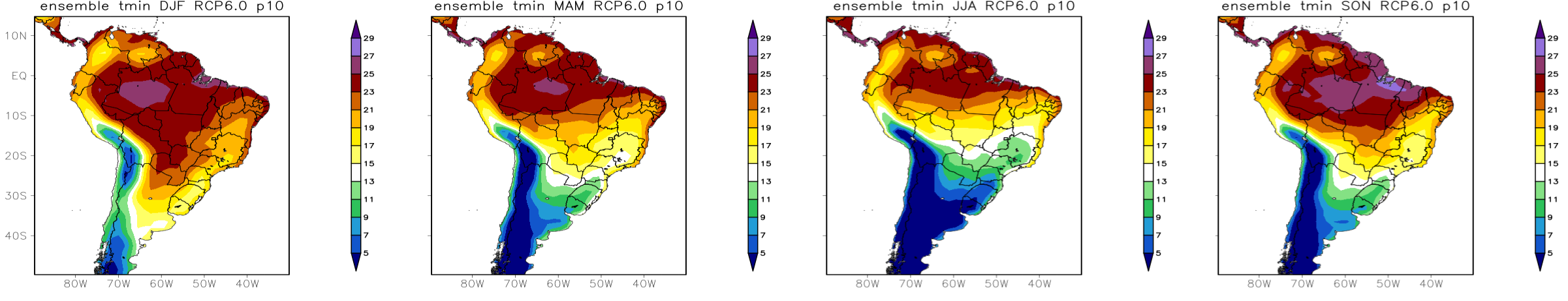
Historical



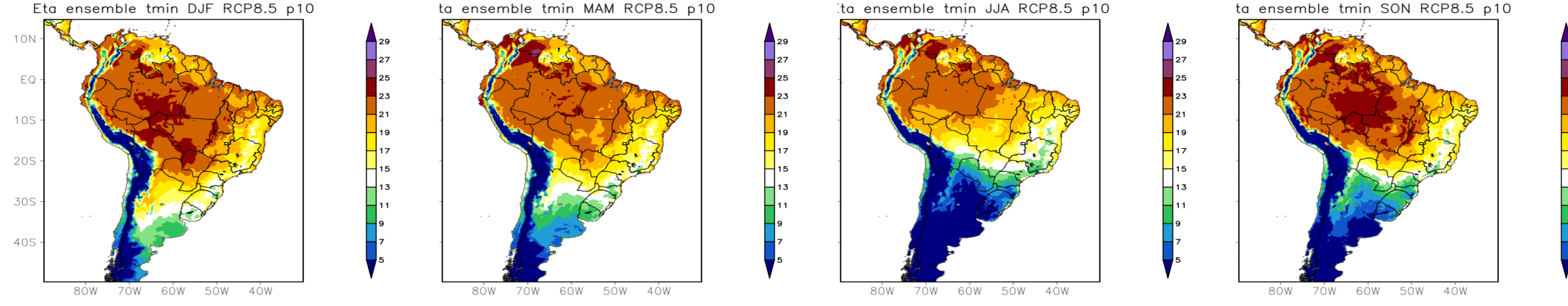
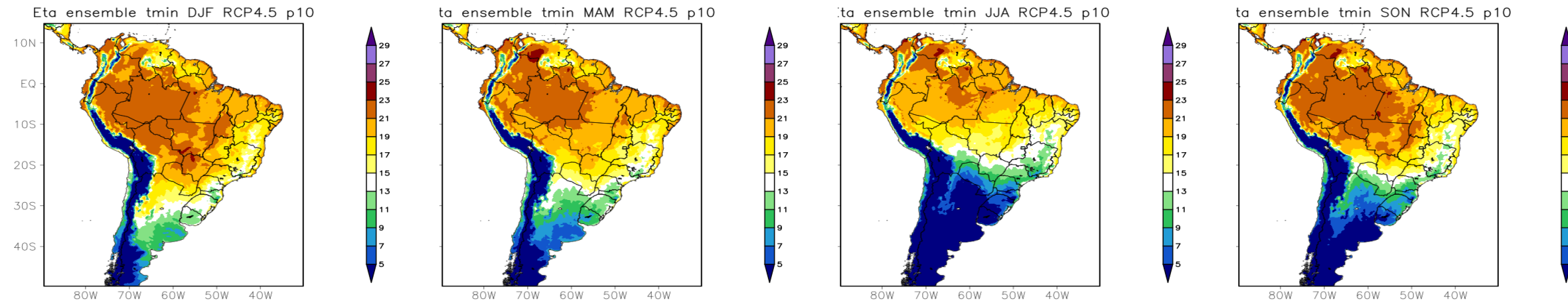
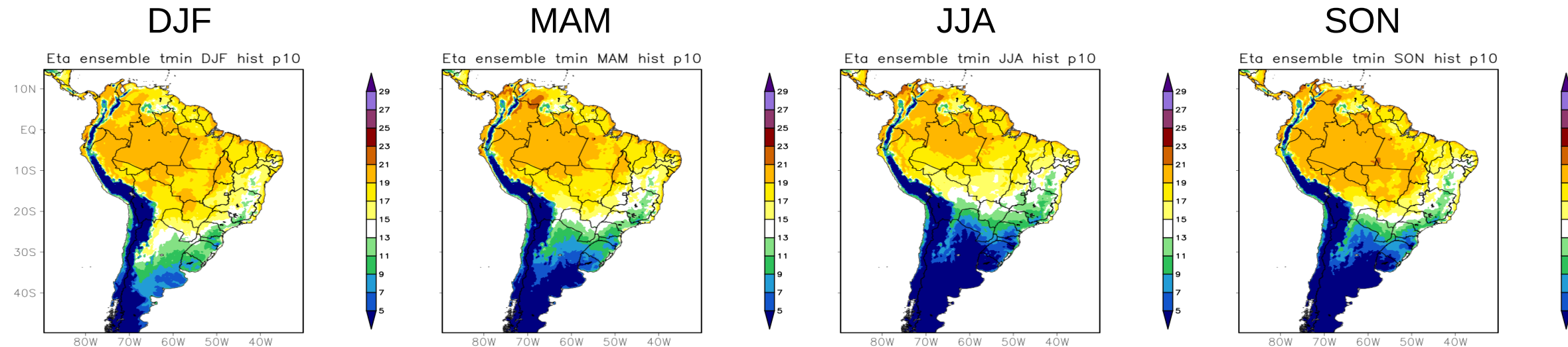
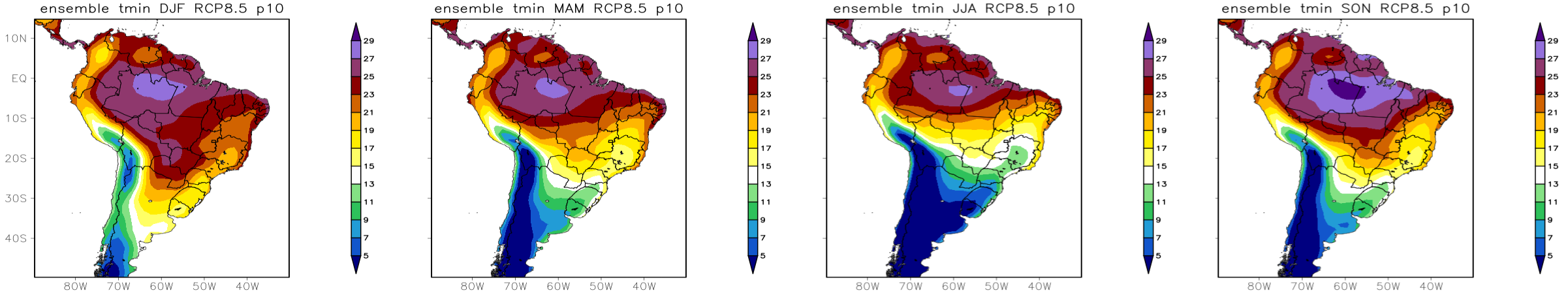
RCP4.5



RCP6.0



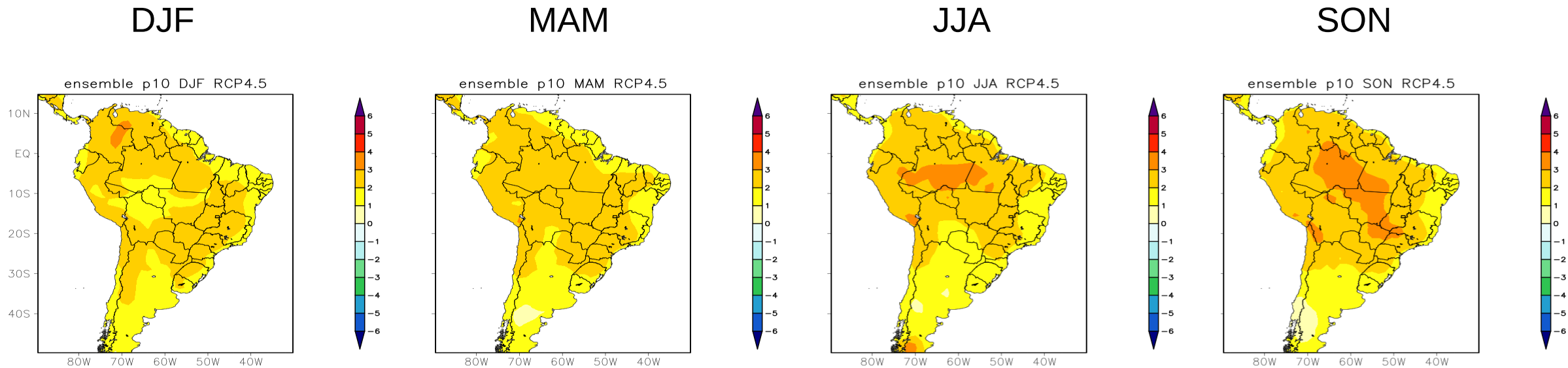
RCP8.5



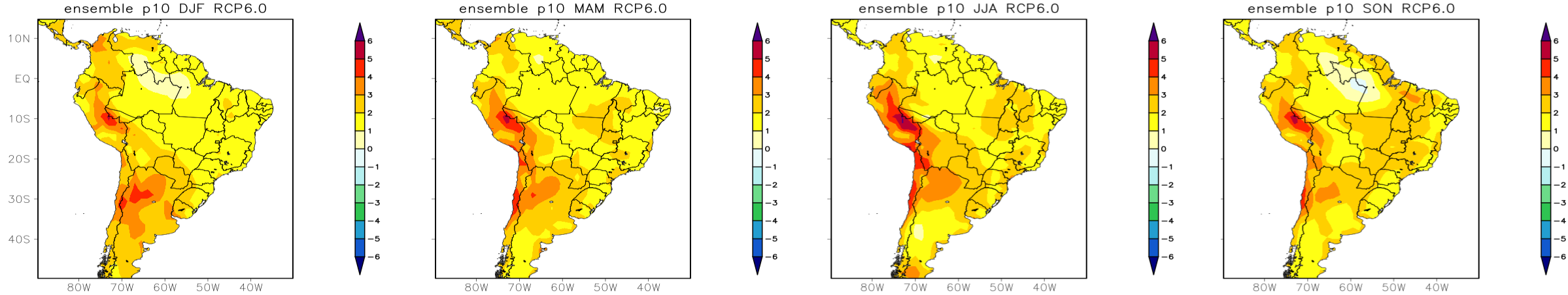
GCMs

ETA

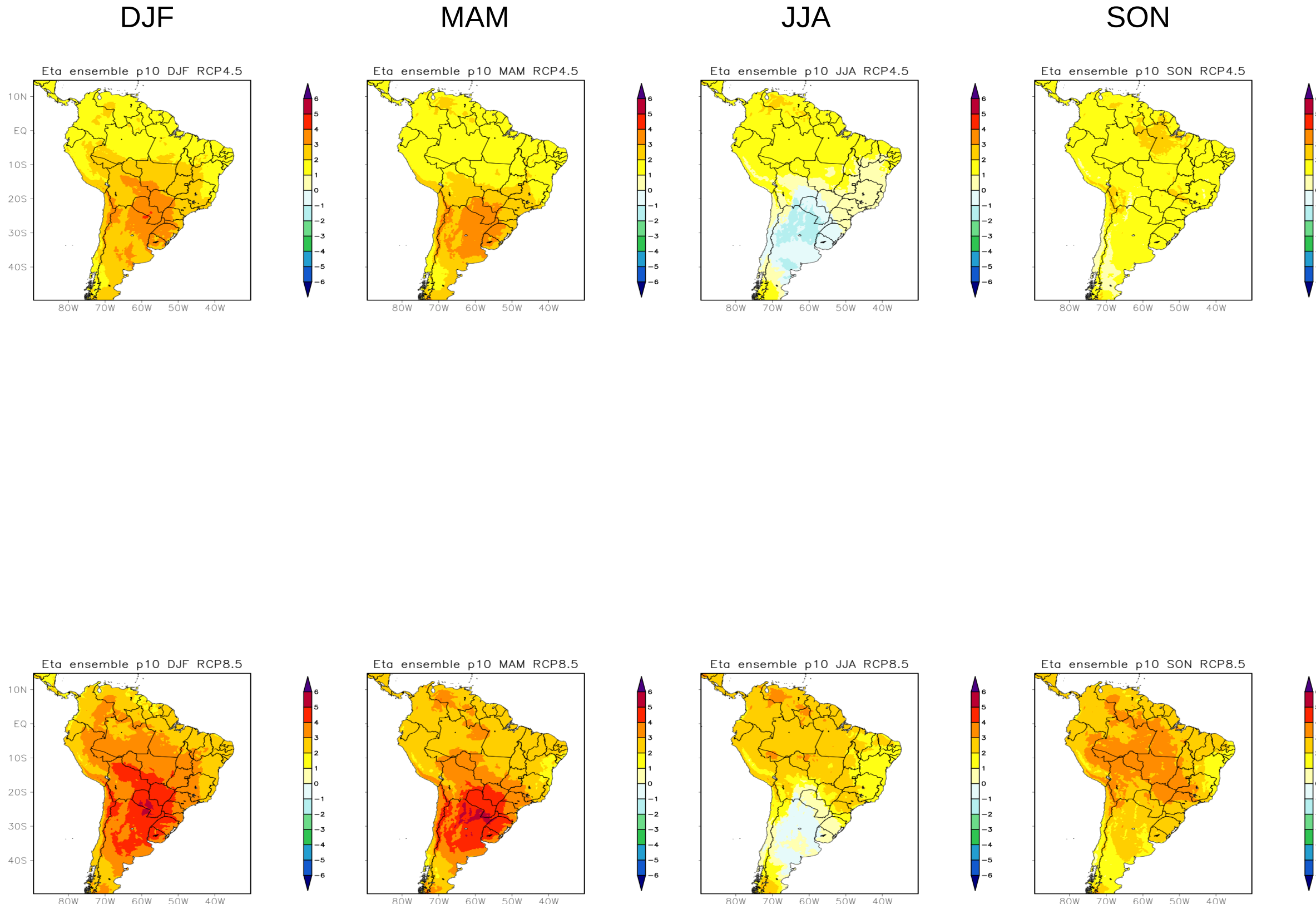
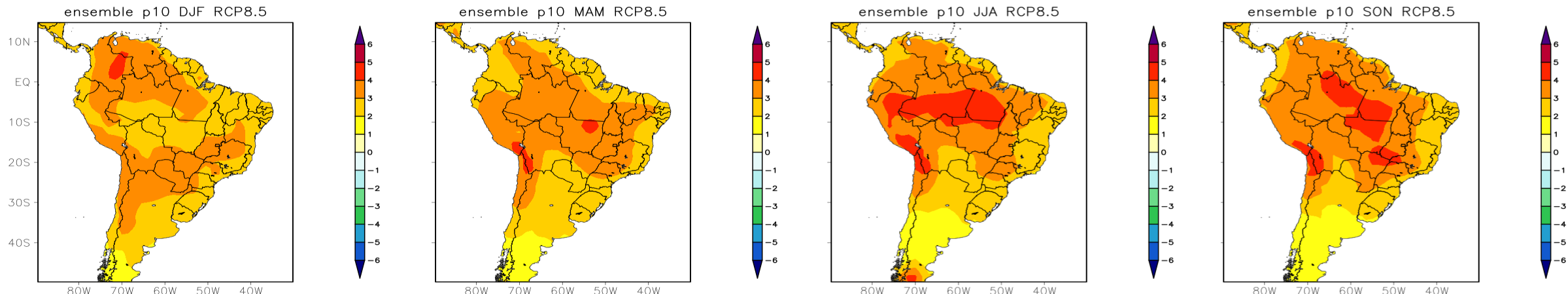
RCP4.5



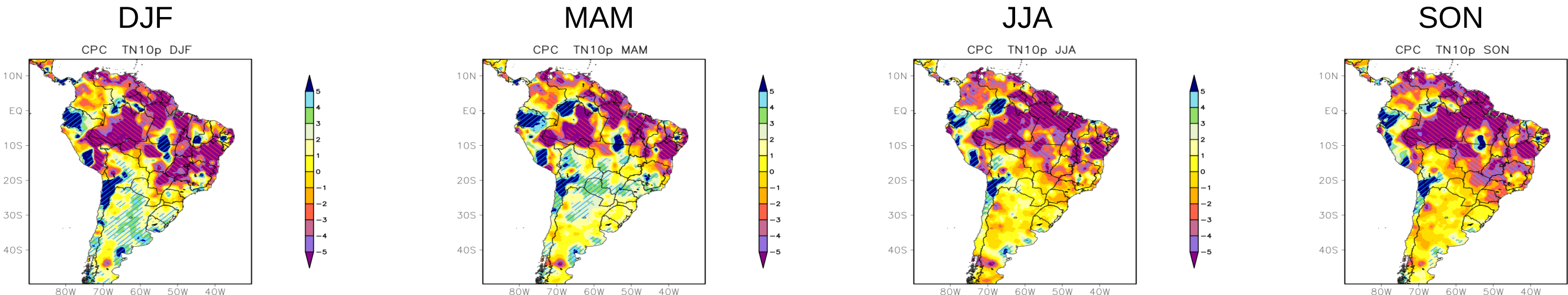
RCP6.0



RCP8.5



CPC

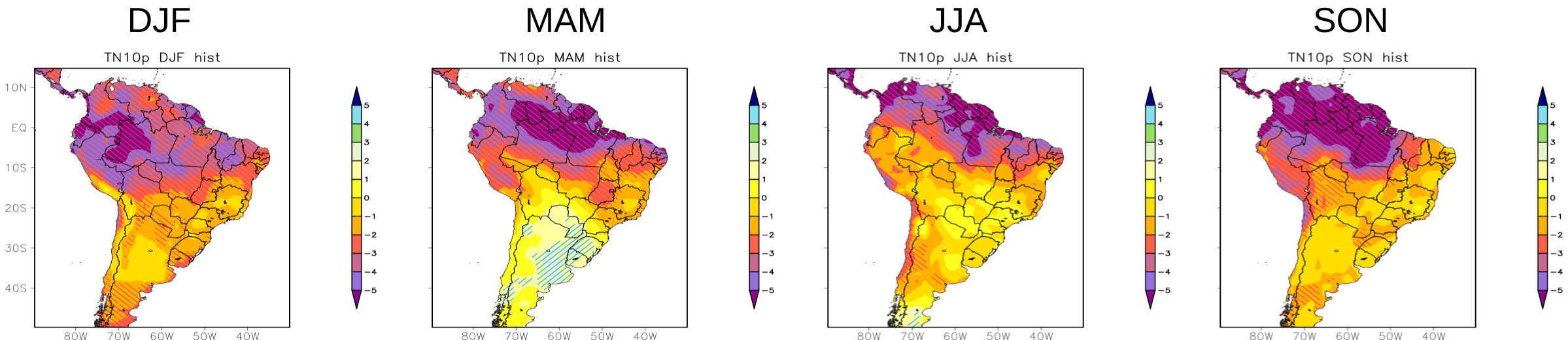


No CPC é apresentada a tendência do TN10p enquanto no futuro é a porcentagem de dias com base no percentil do presente

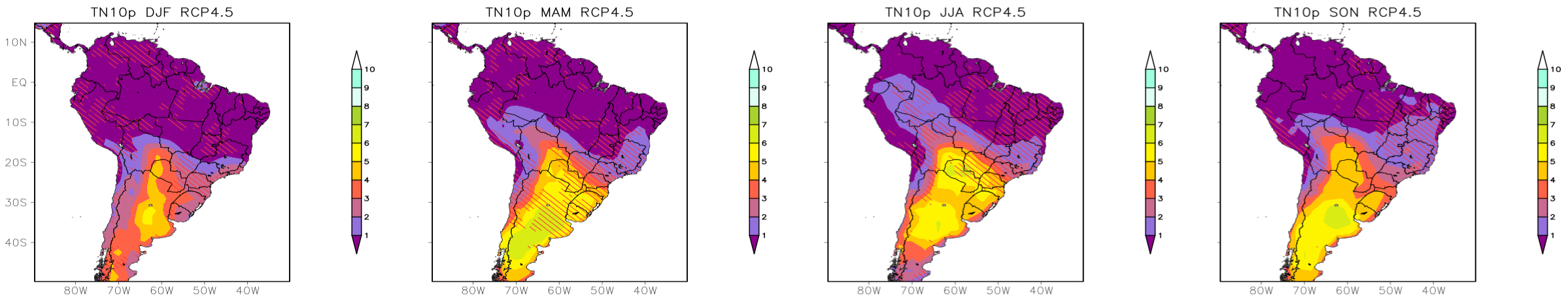
GCMs

ETA

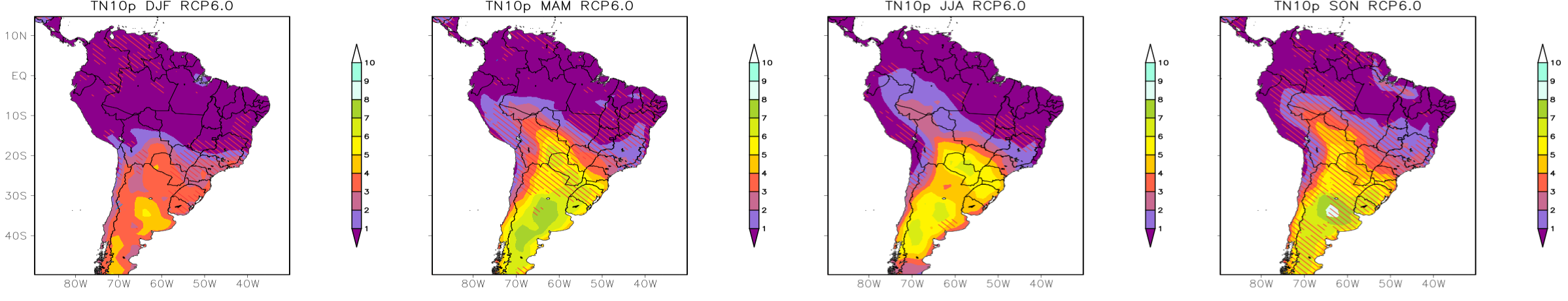
Historical



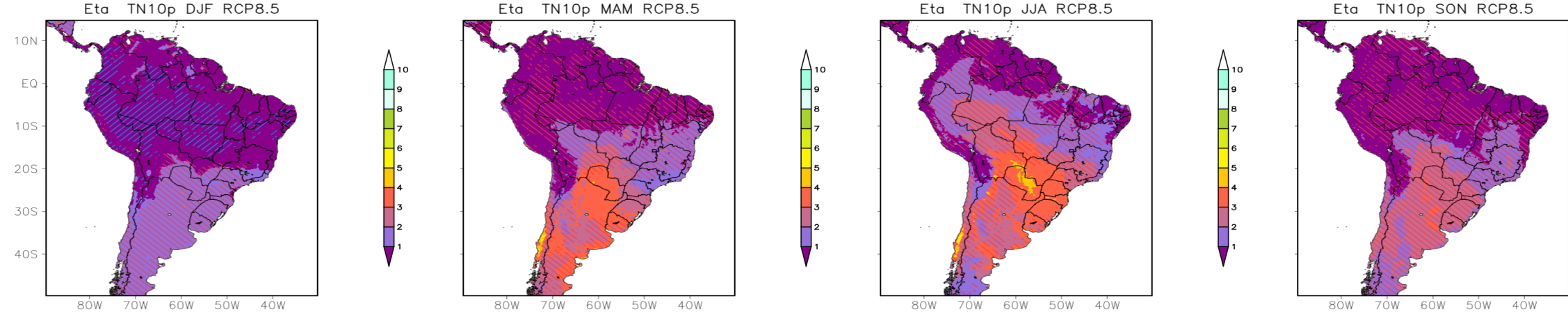
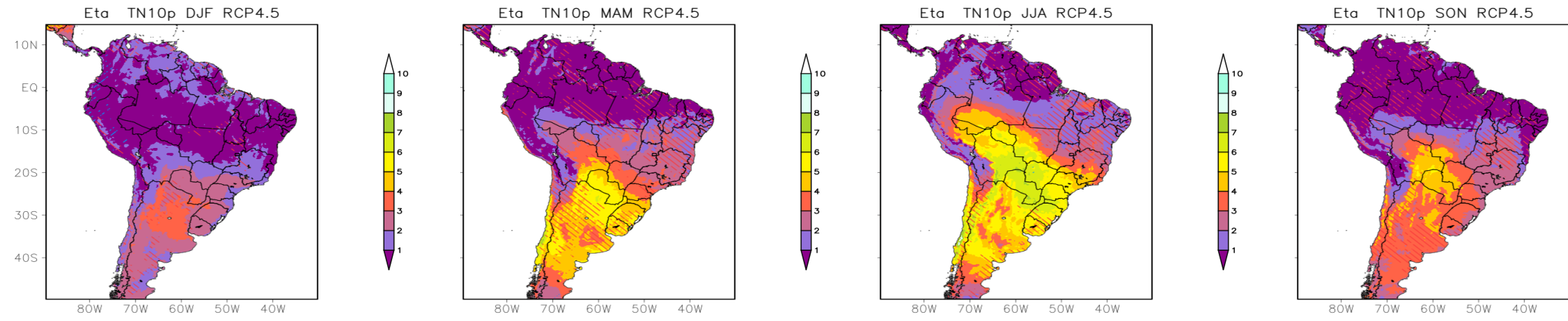
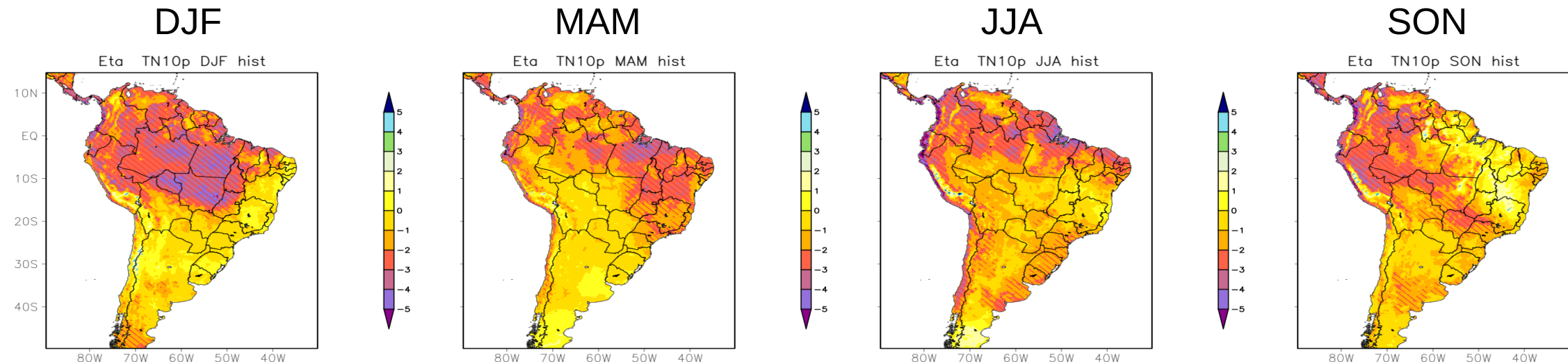
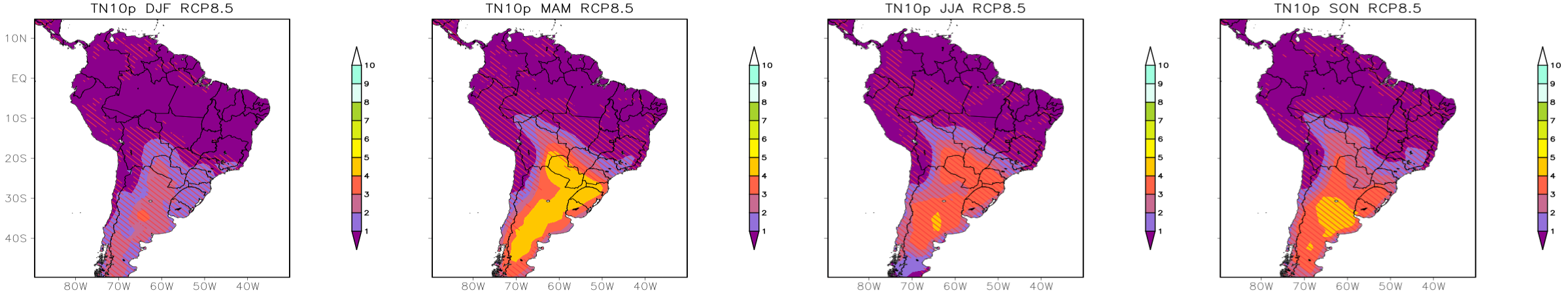
RCP4.5



RCP6.0



RCP8.5



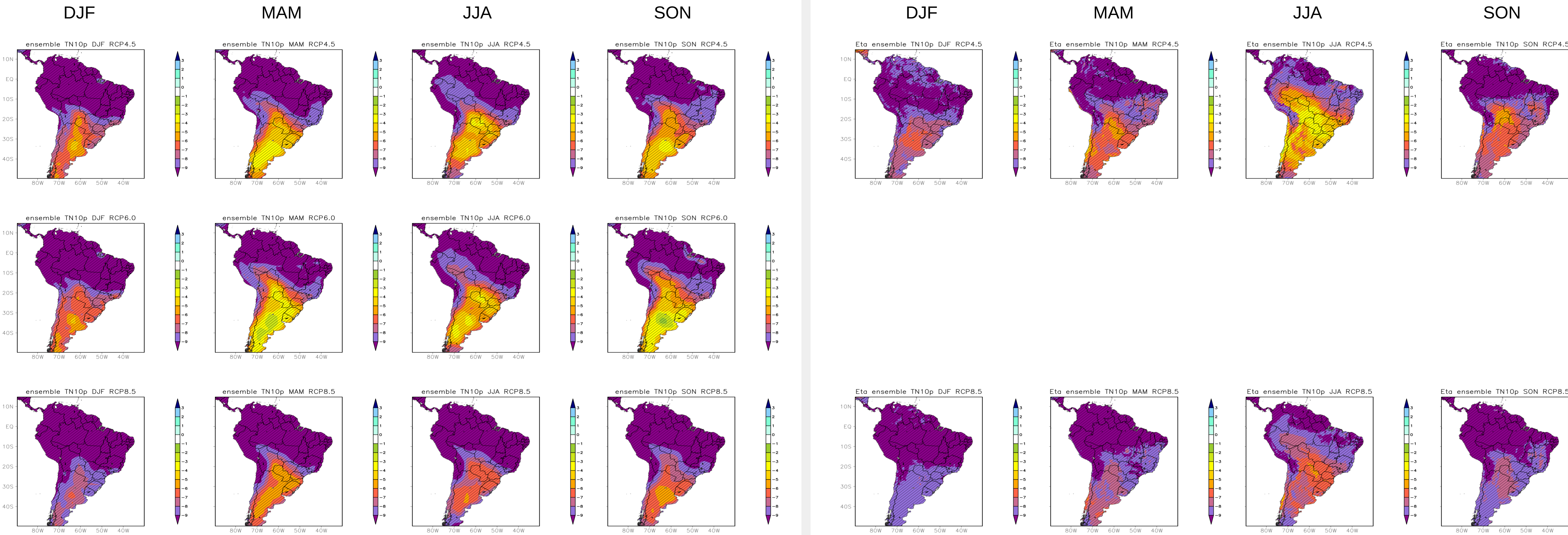
RCP4.5

RCP6.0

RCP8.5

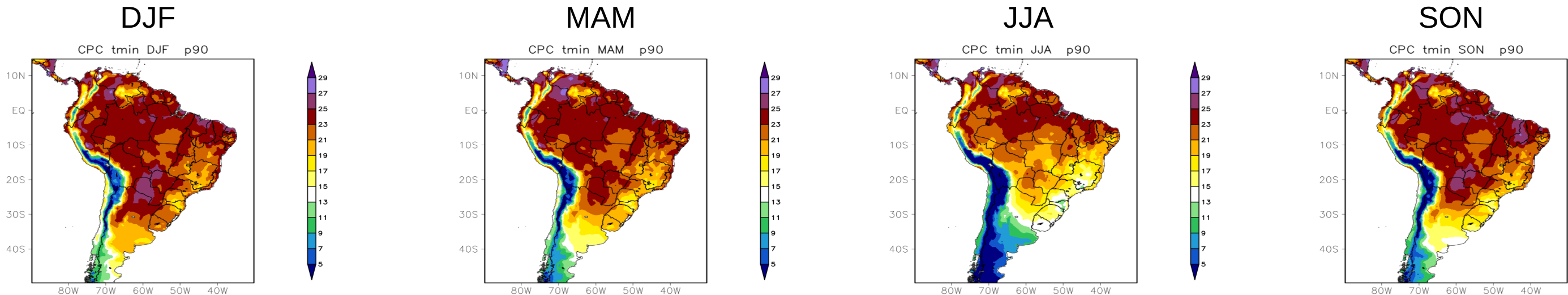
GCMs

ETA



TN90 - valor do percentil de 90% (°C)

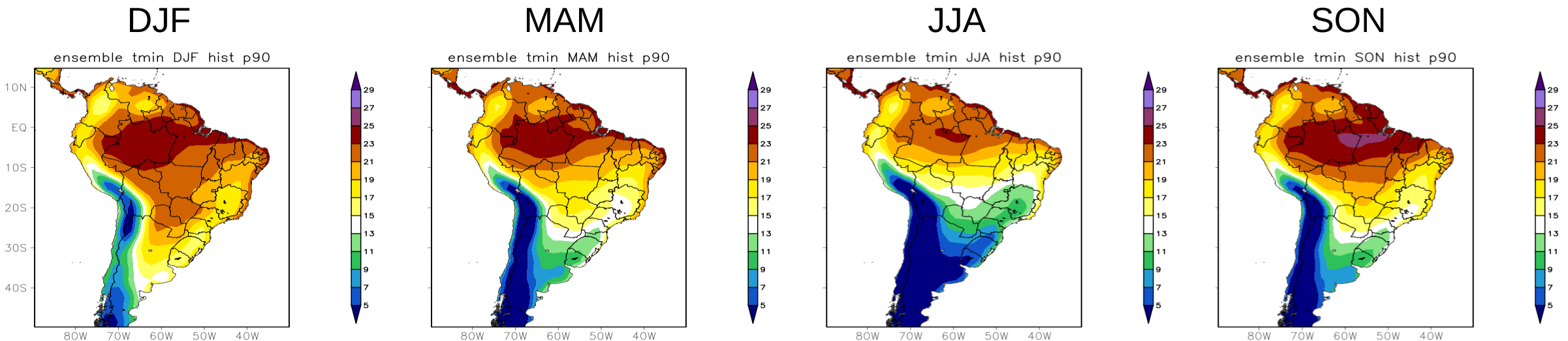
CPC



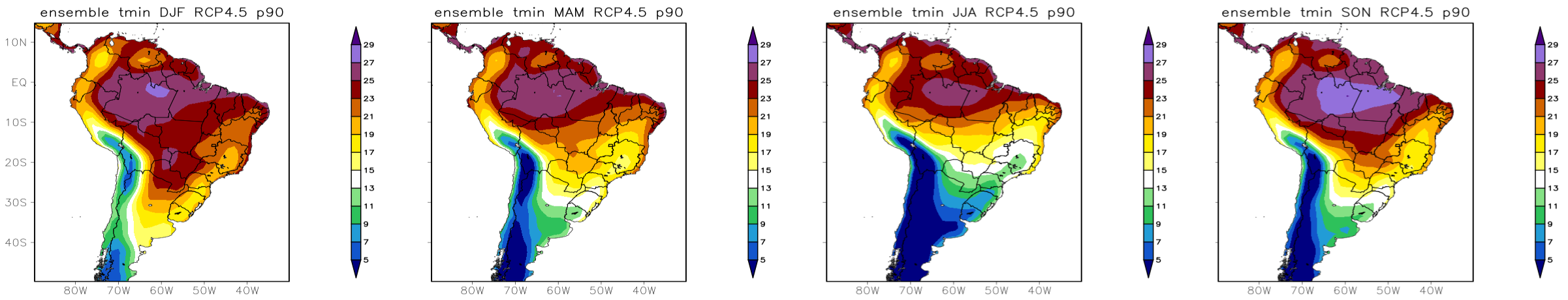
GCMs

ETA

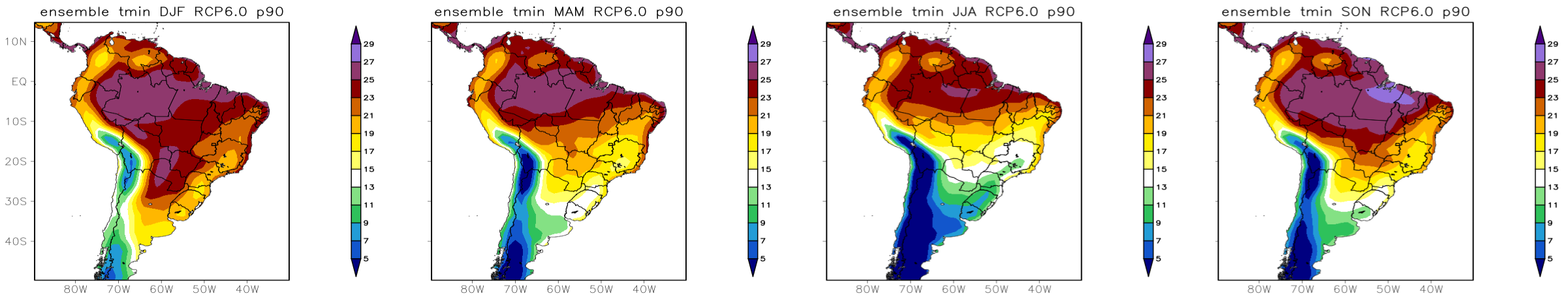
Historical



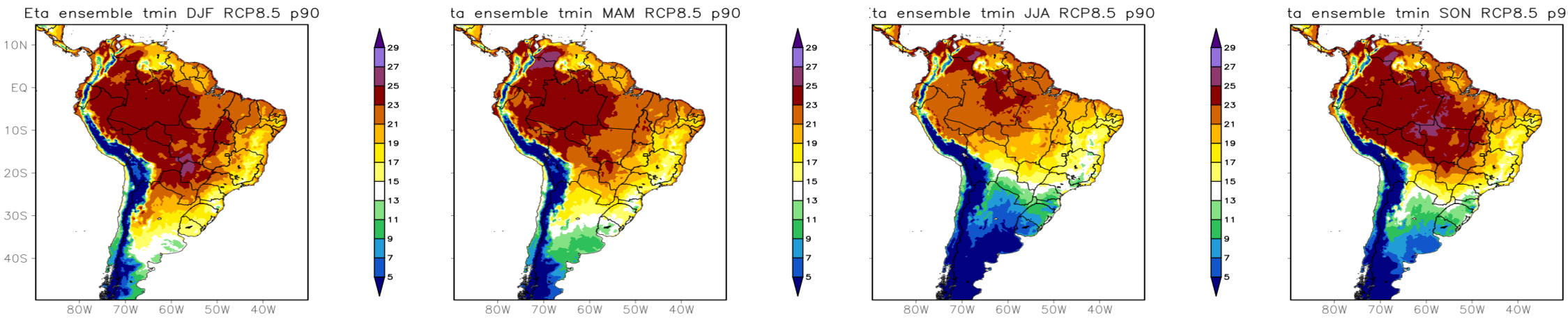
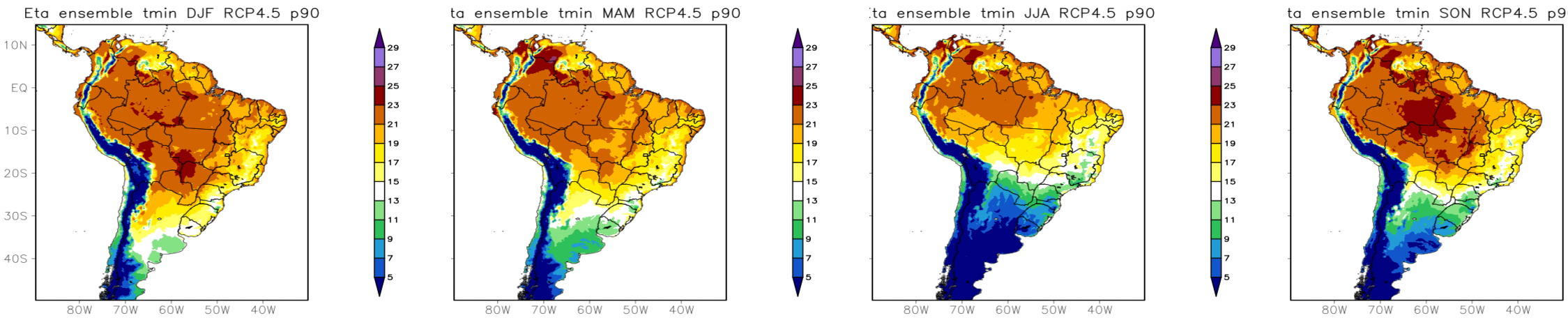
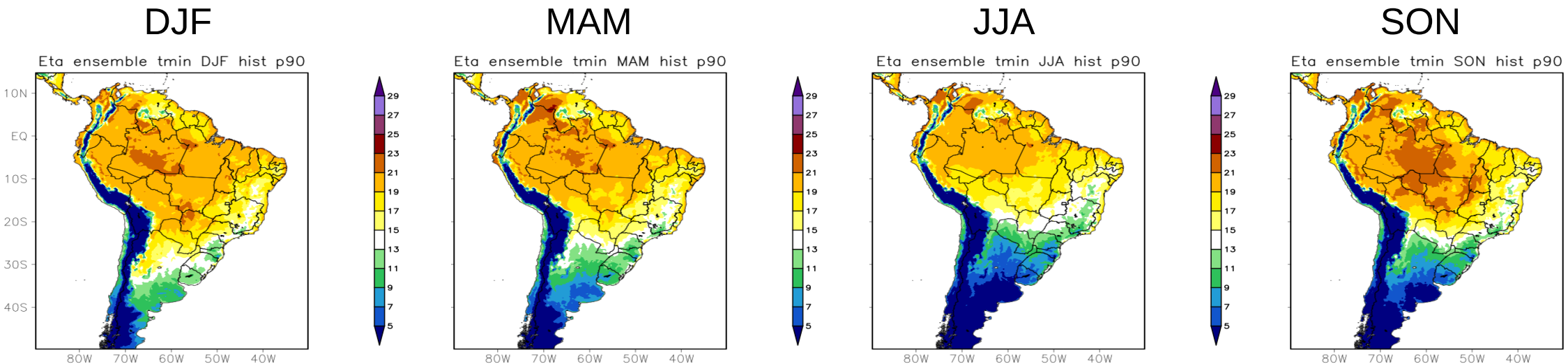
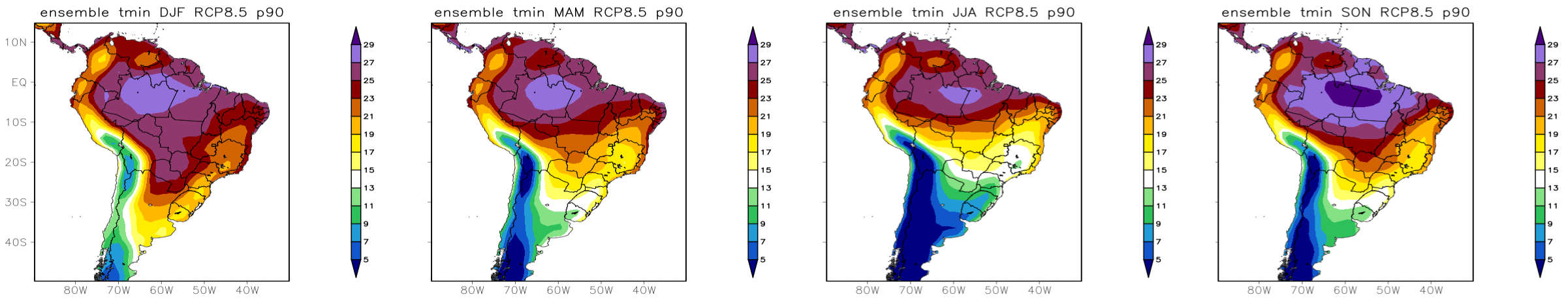
RCP4.5



RCP6.0



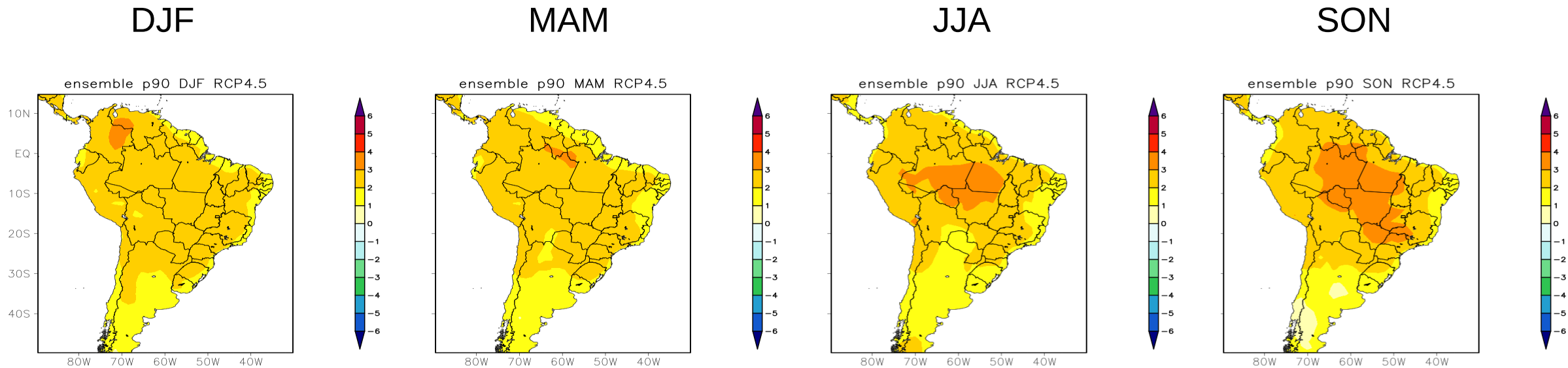
RCP8.5



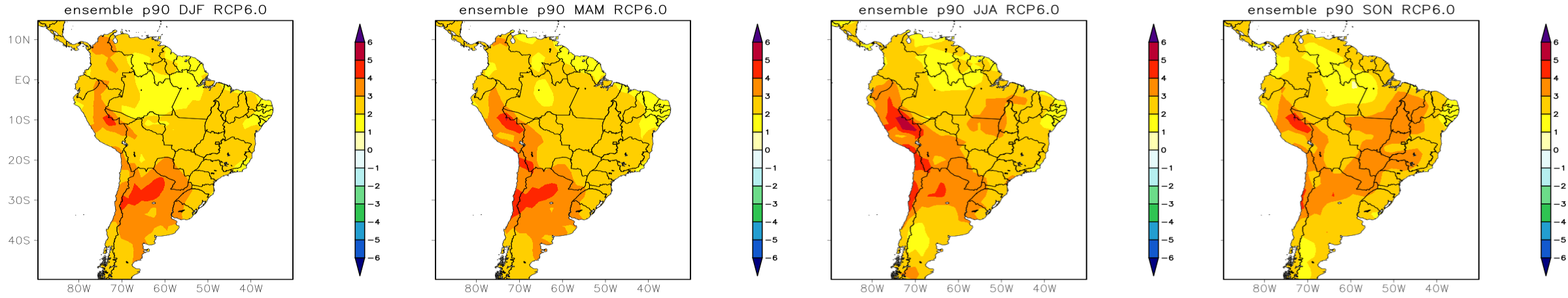
GCMs

ETA

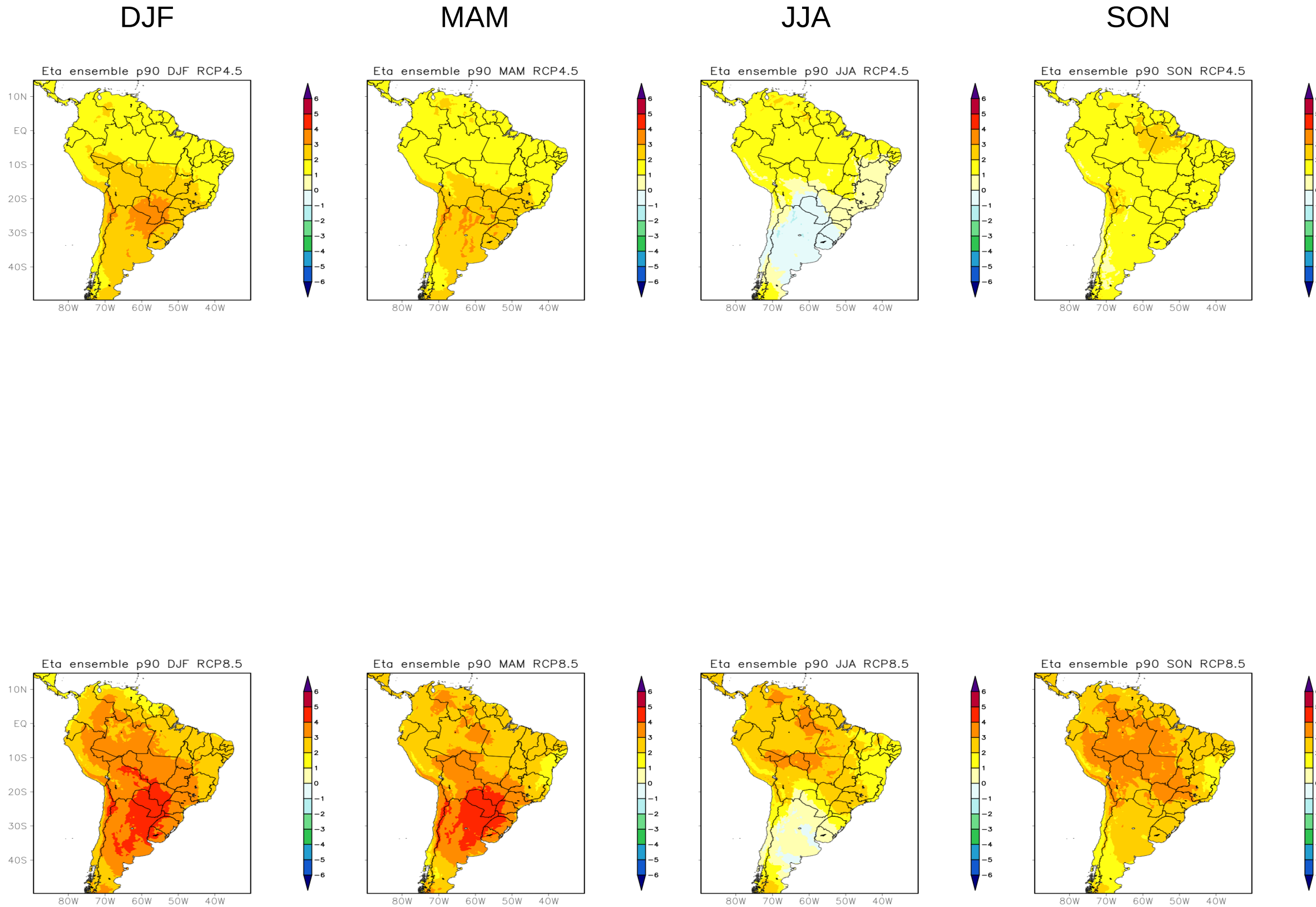
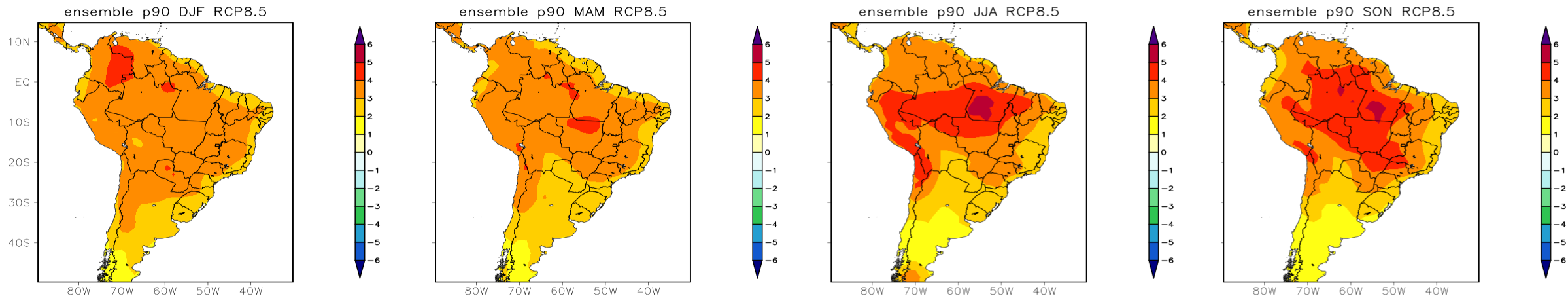
RCP4.5



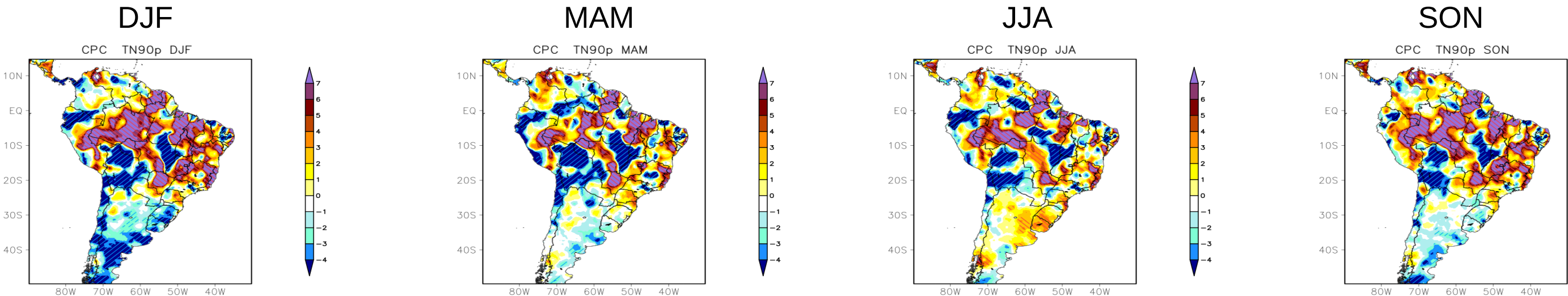
RCP6.0



RCP8.5



CPC

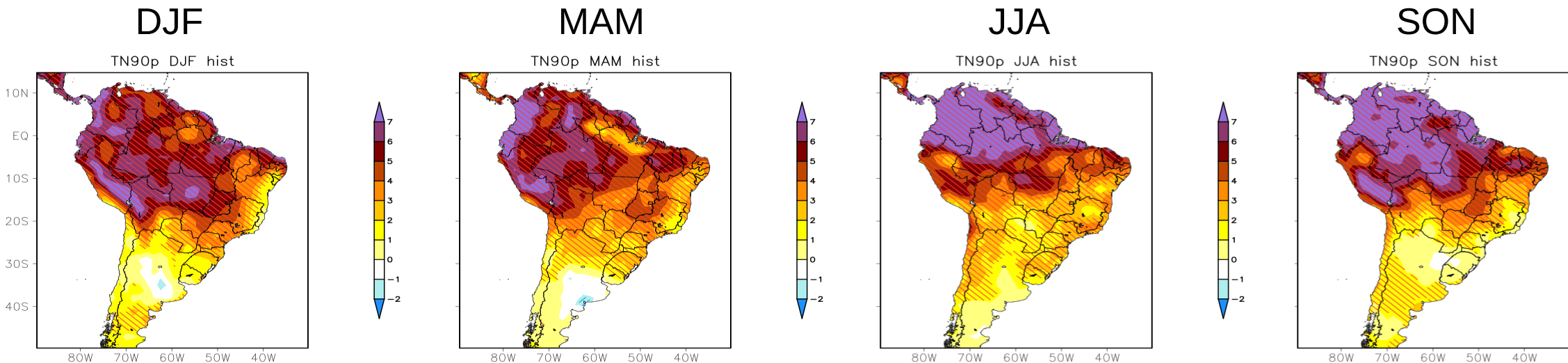


No CPC é apresentada a tendência do TN90p enquanto no futuro é a porcentagem de dias com base no percentil do presente

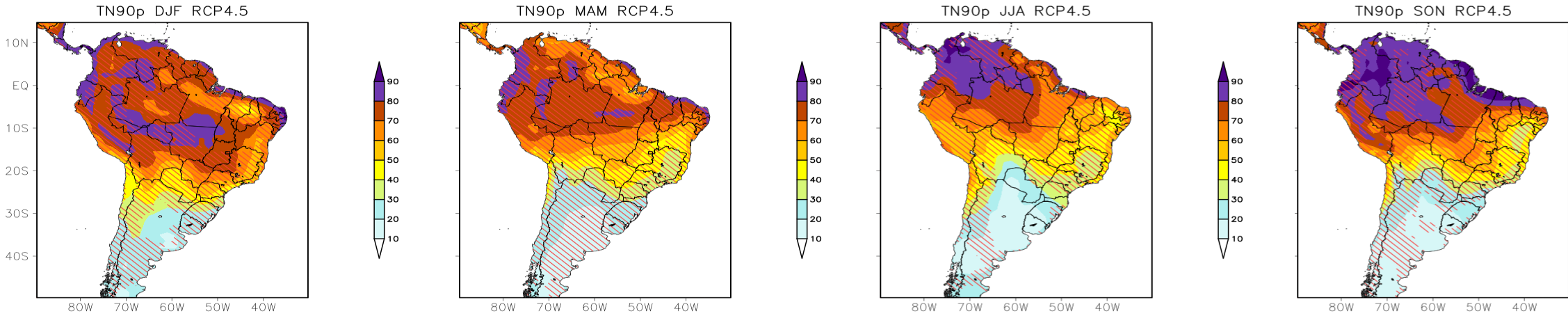
GCMs

ETA

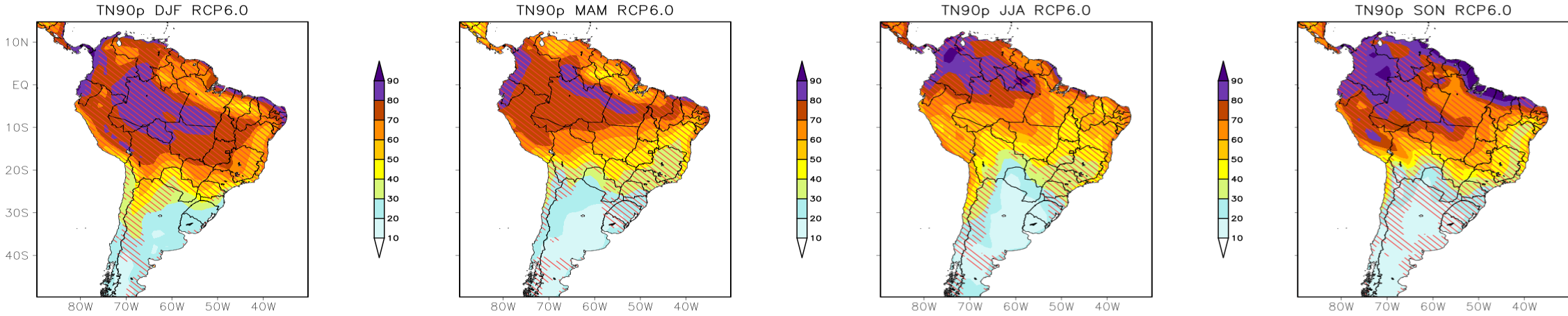
Historical



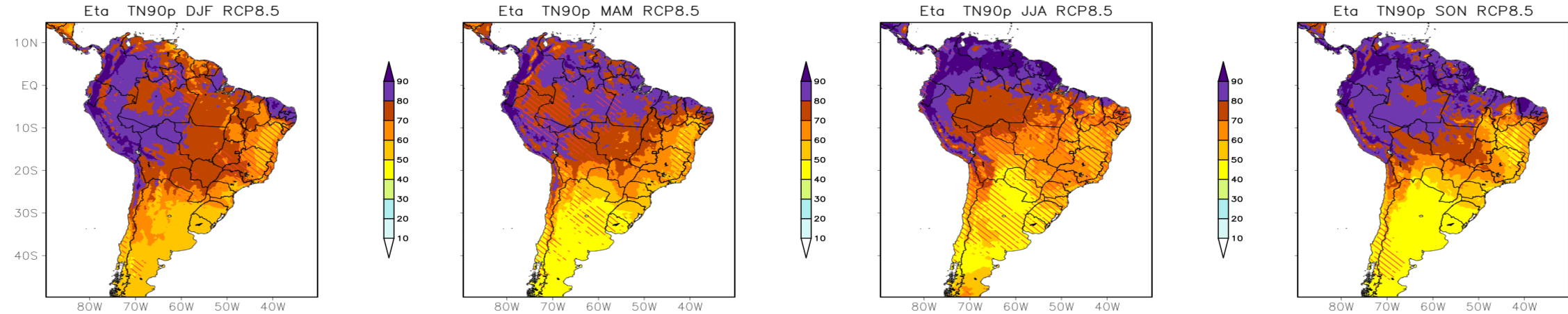
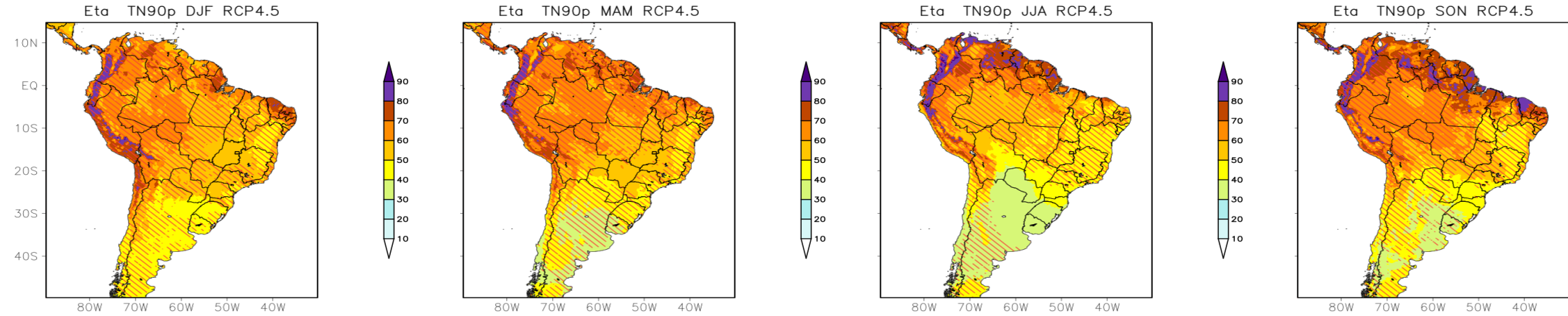
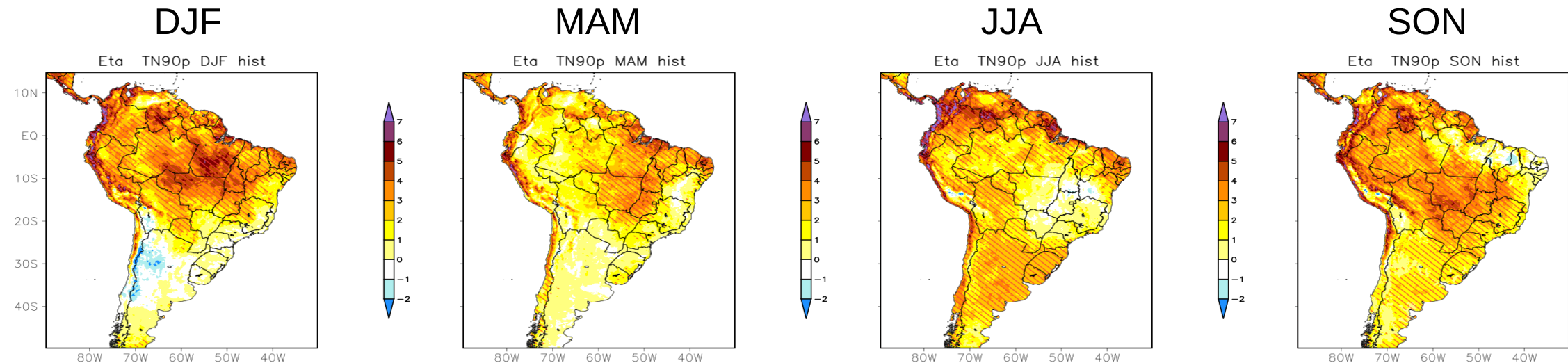
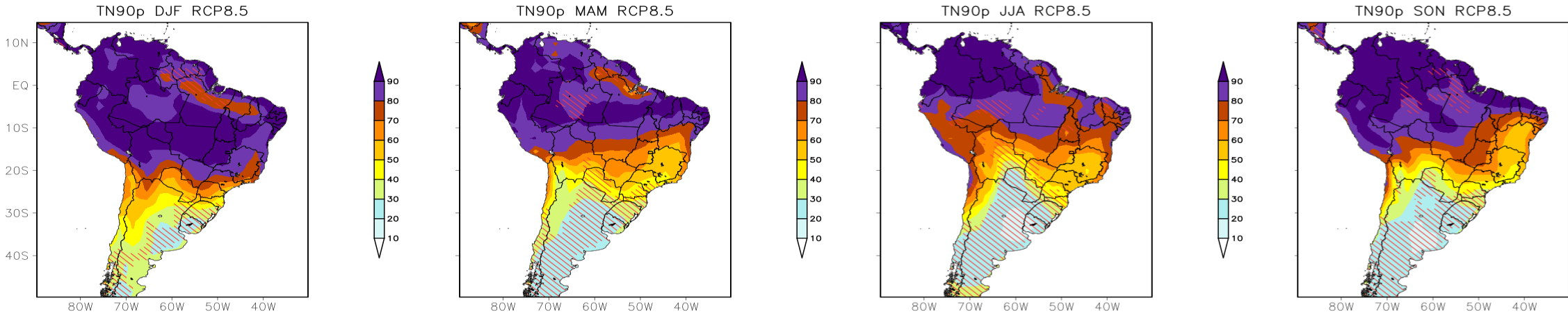
RCP4.5



RCP6.0



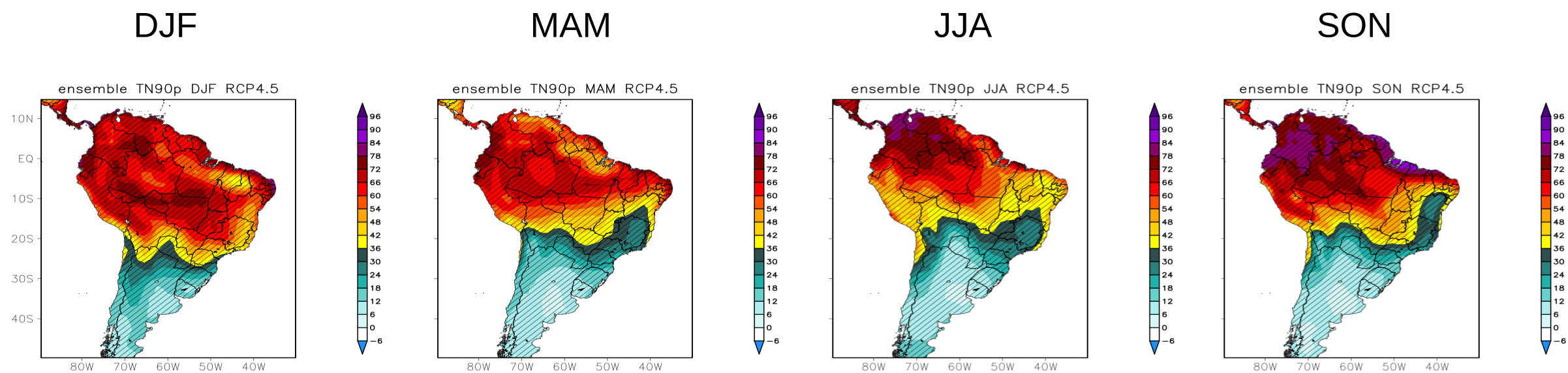
RCP8.5



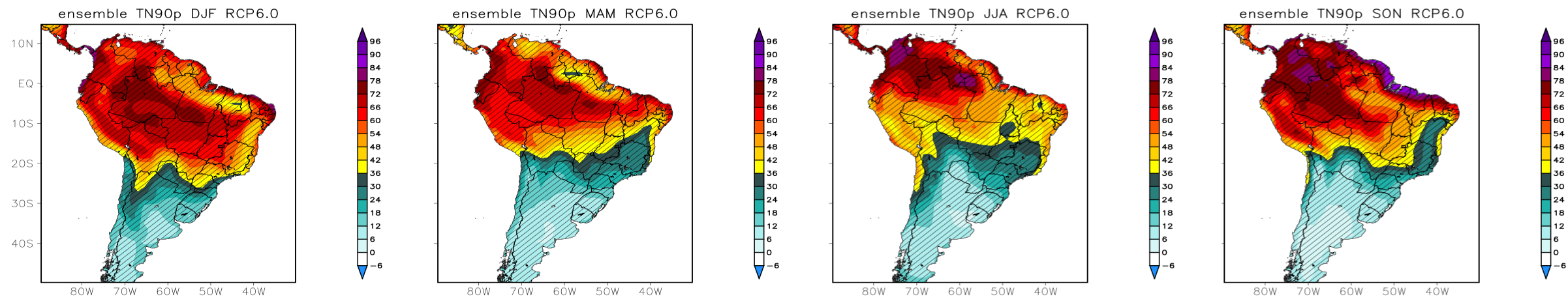
GCMs

ETA

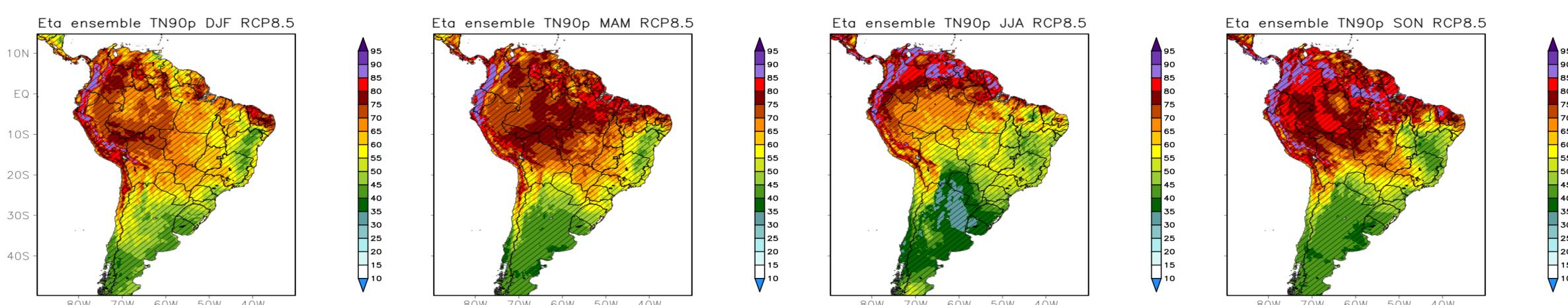
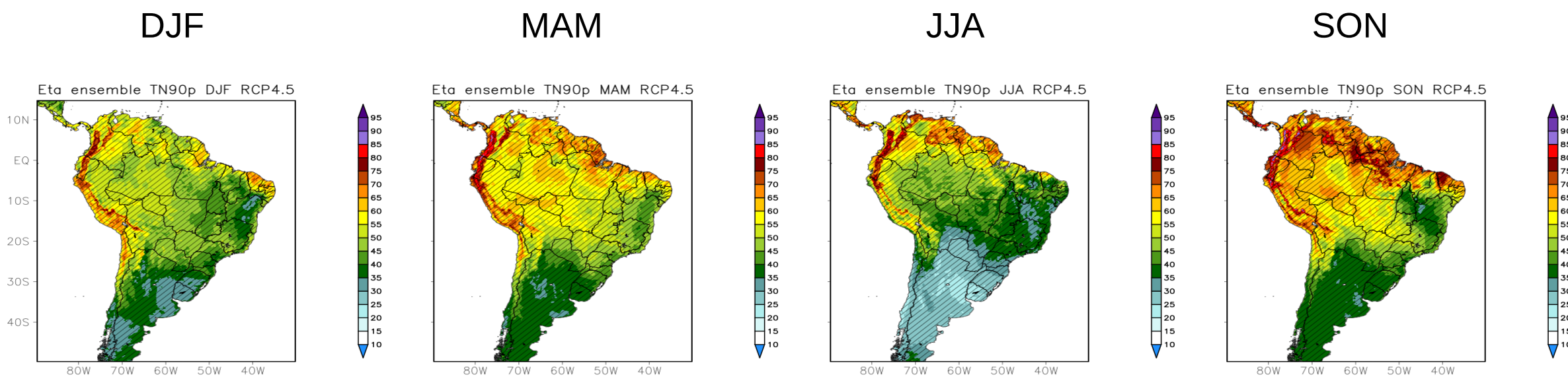
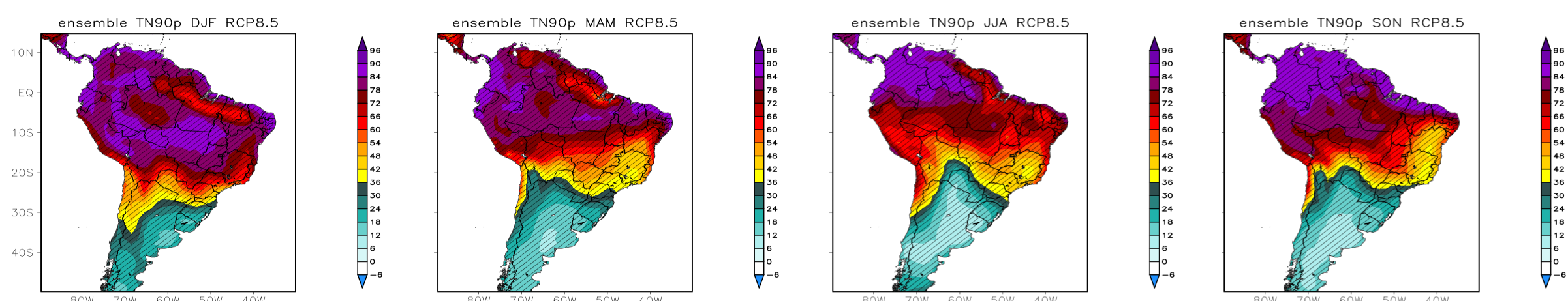
RCP4.5



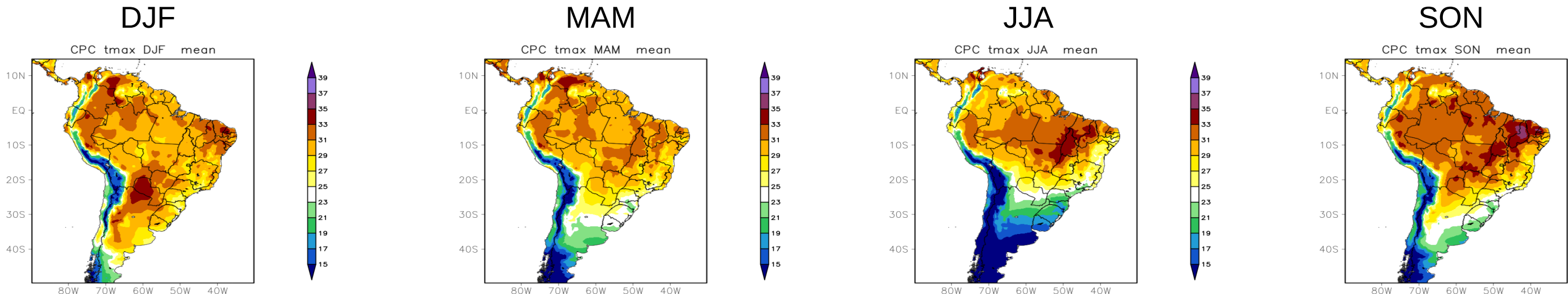
RCP6.0



RCP8.5



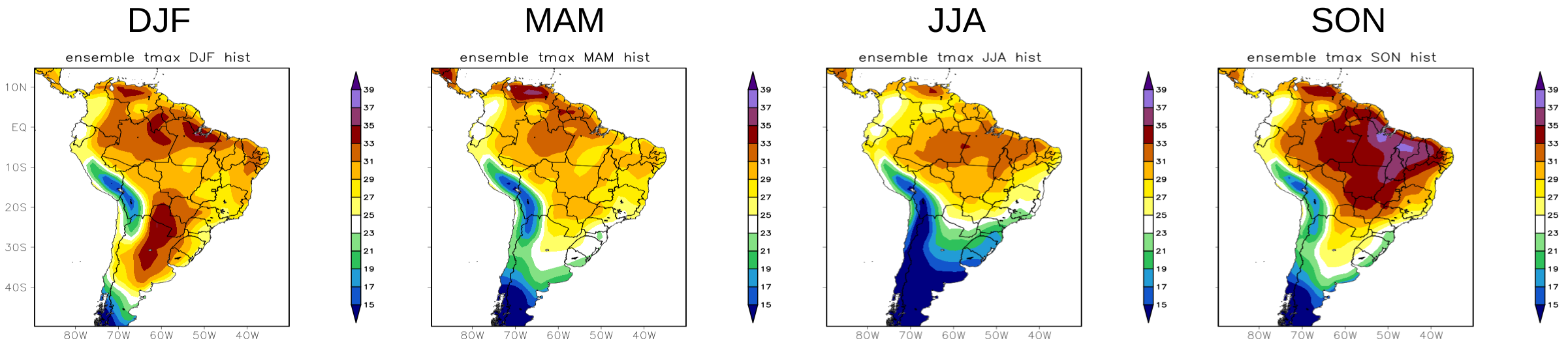
CPC



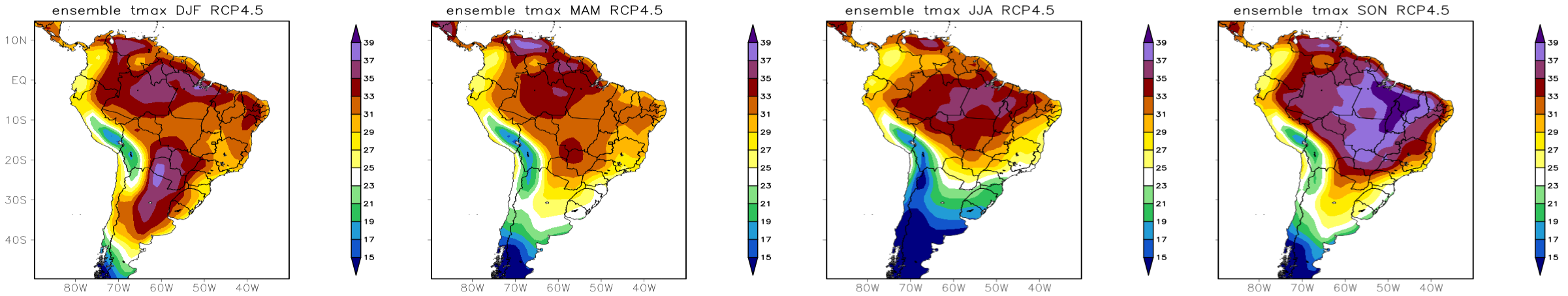
GCMs

ETA

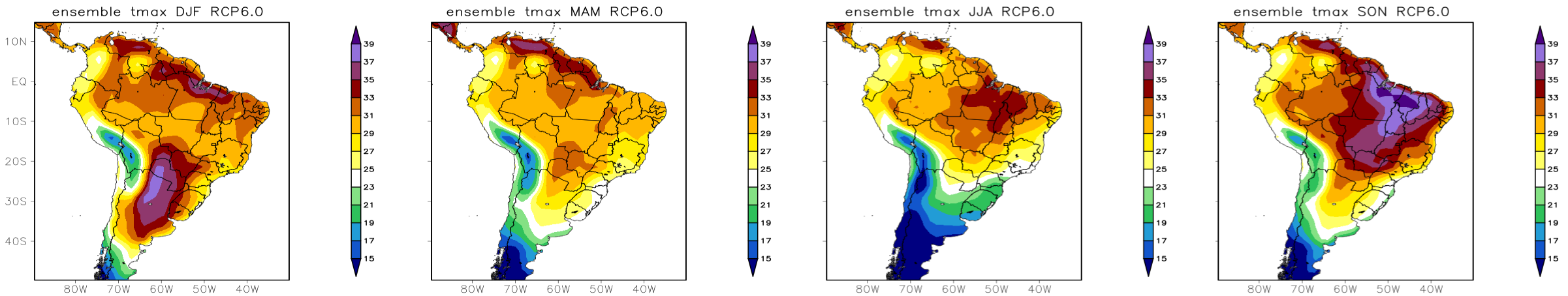
Historical



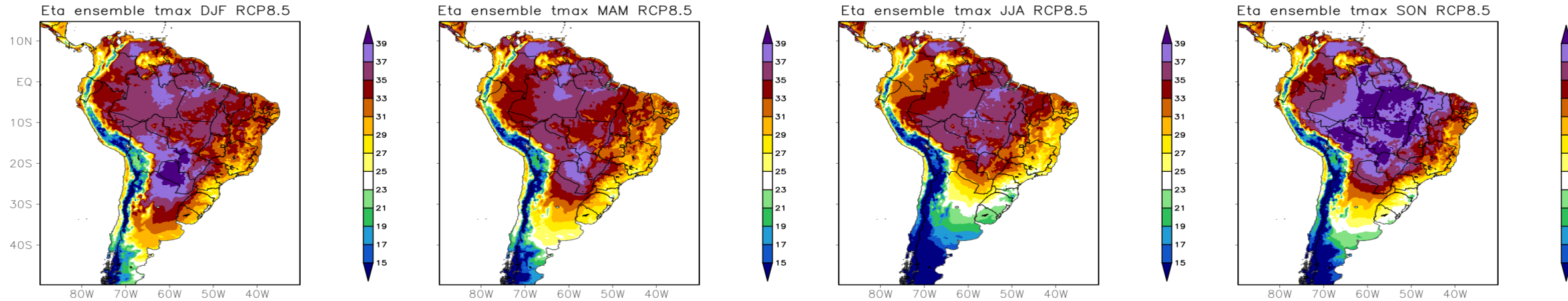
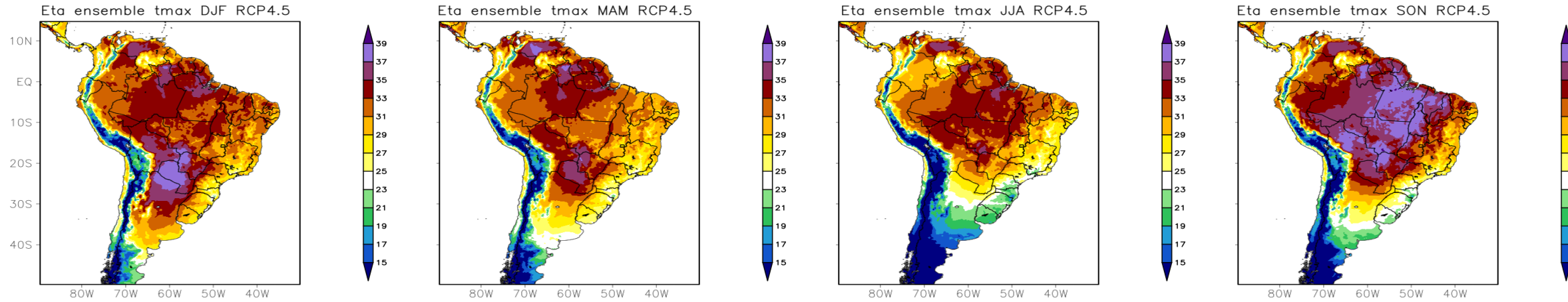
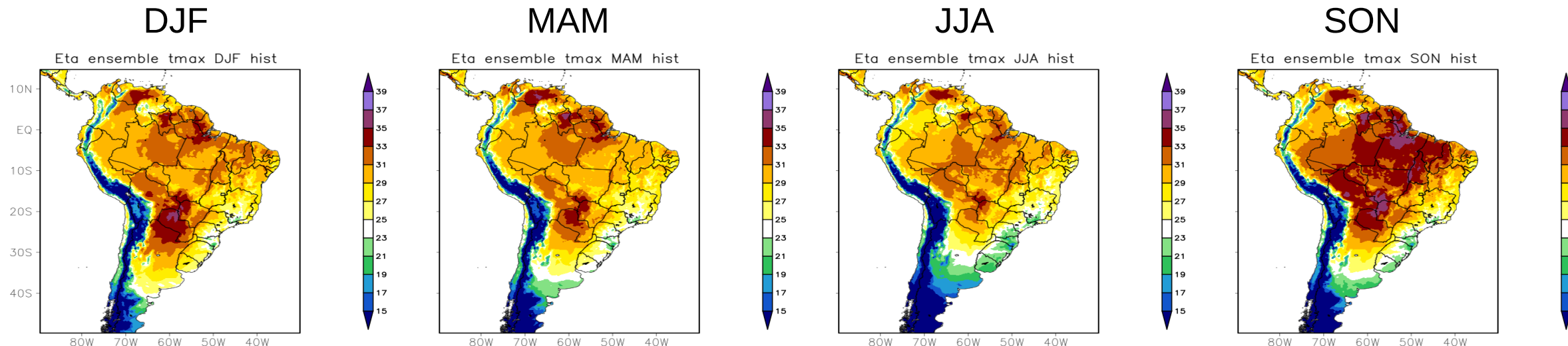
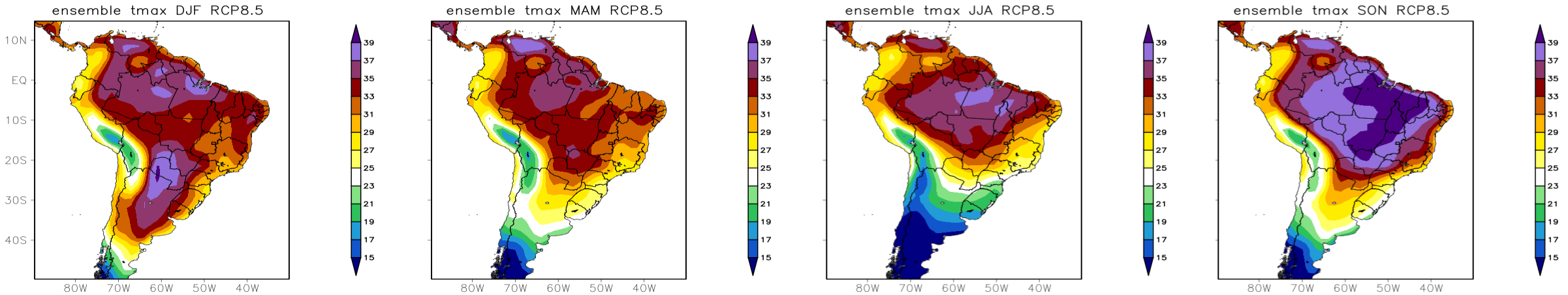
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RCP6.0



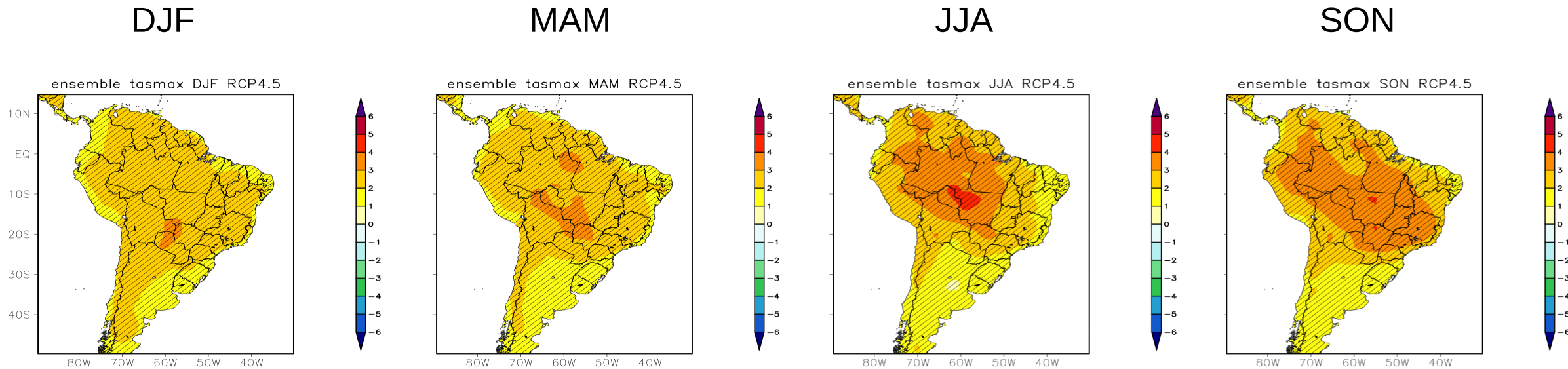
RCP8.5



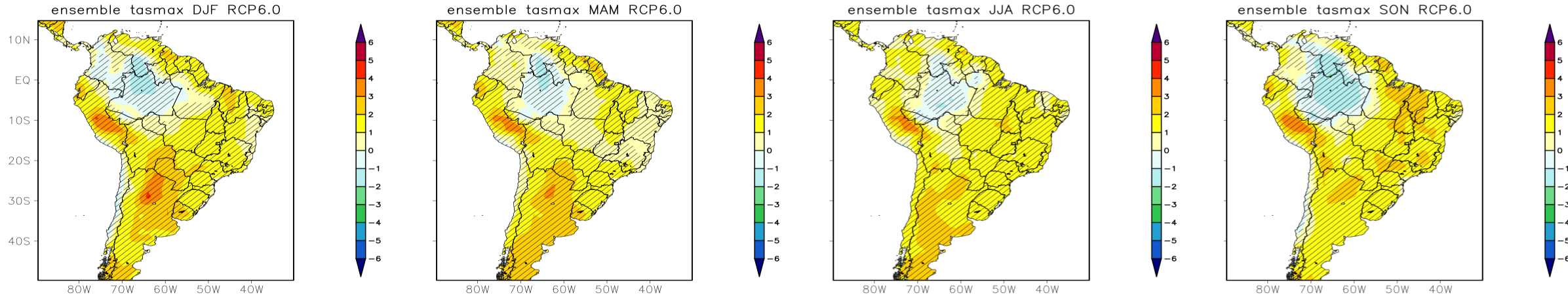
GCMs

ETA

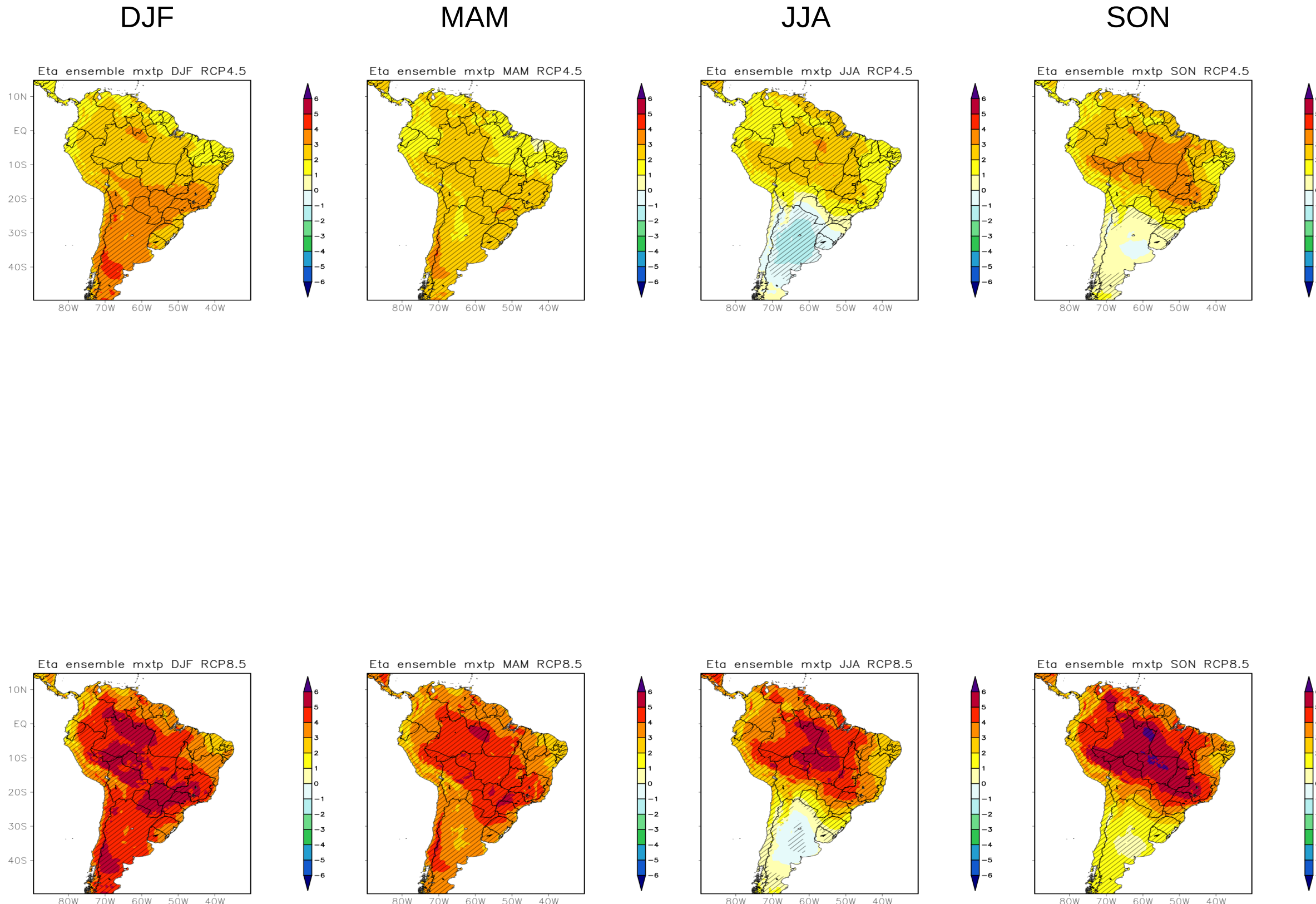
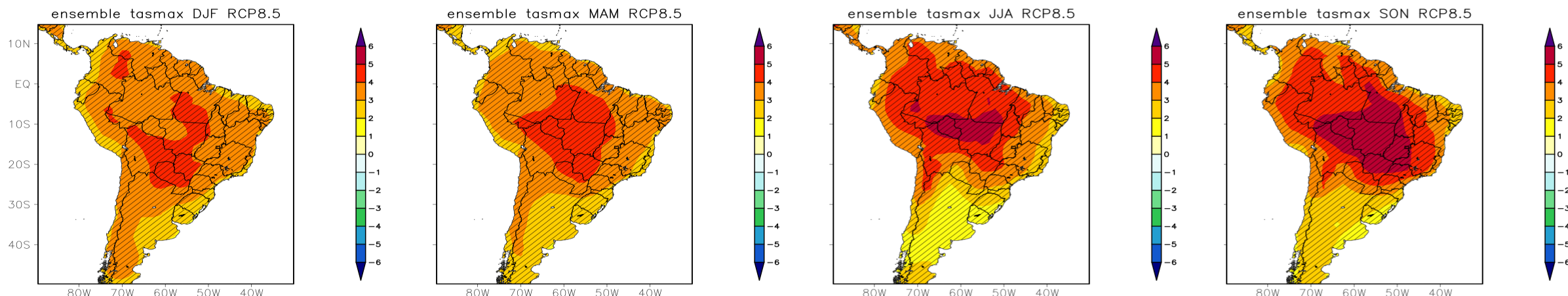
RCP4.5



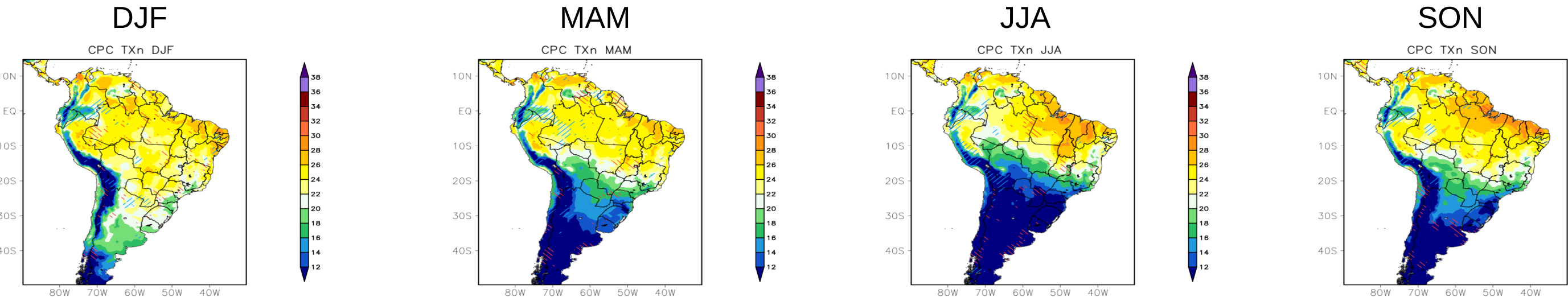
RCP6.0



RCP8.5



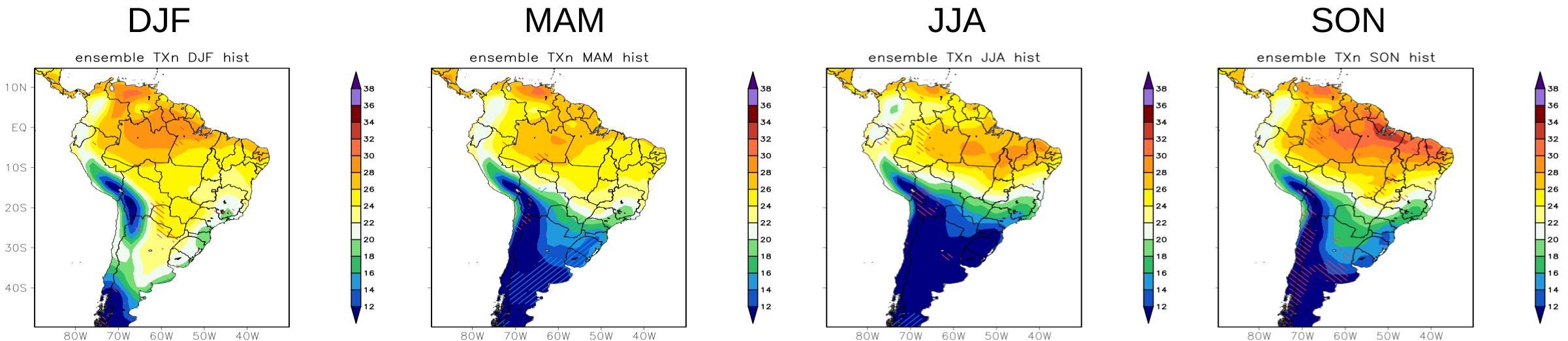
CPC



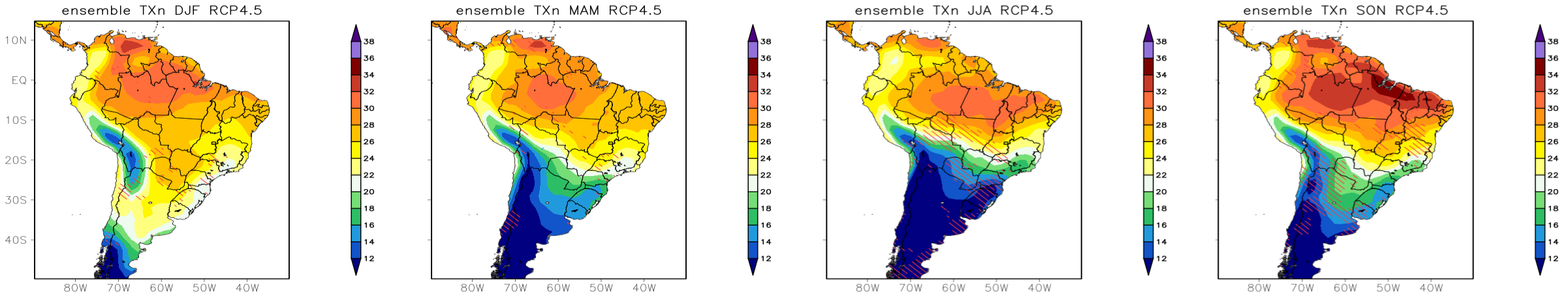
GCMs

ETA

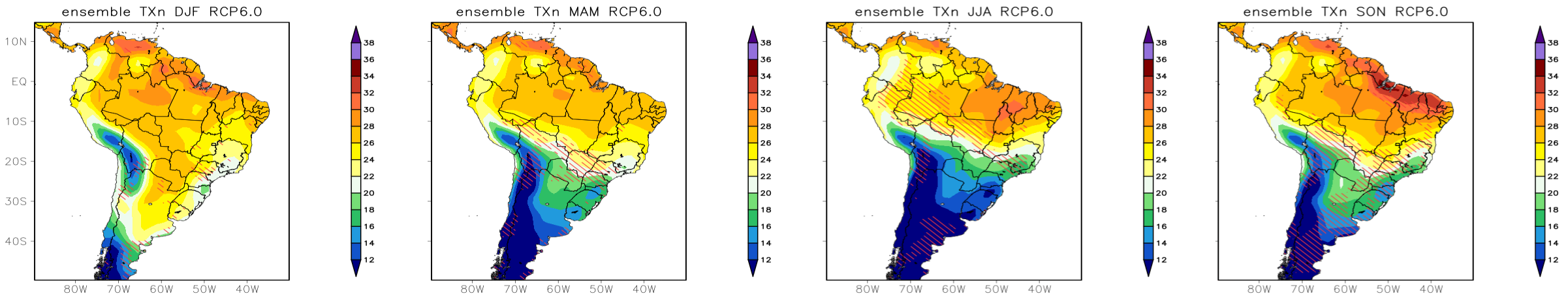
Historical



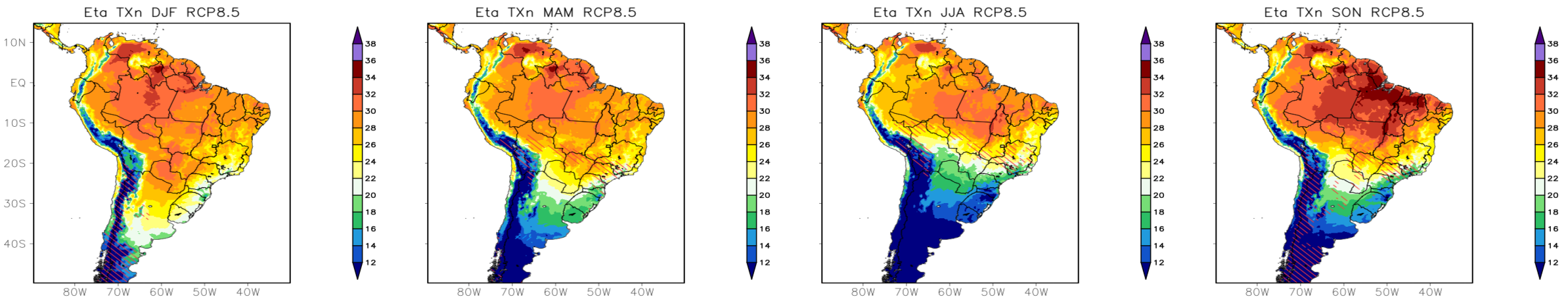
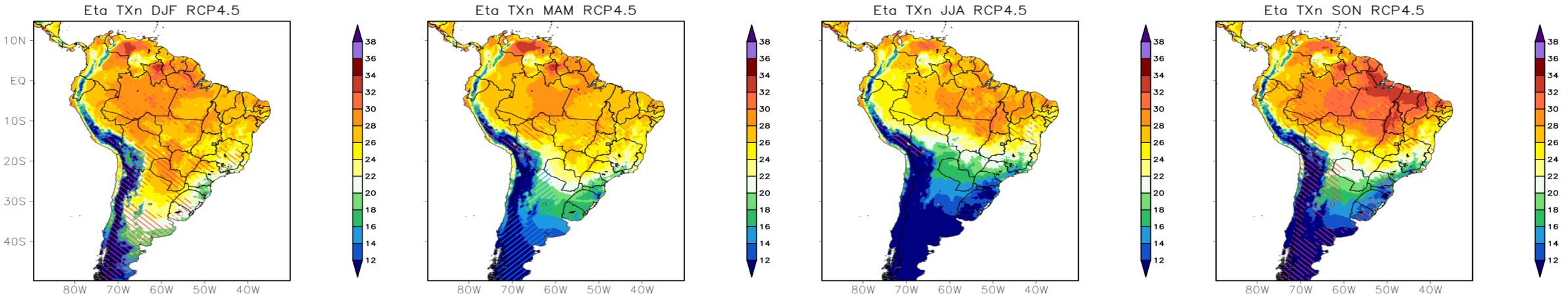
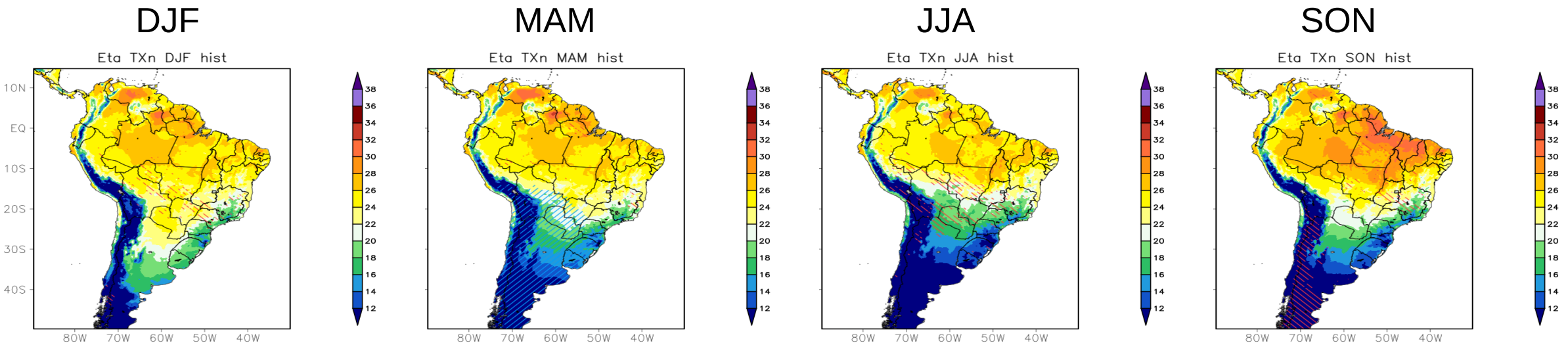
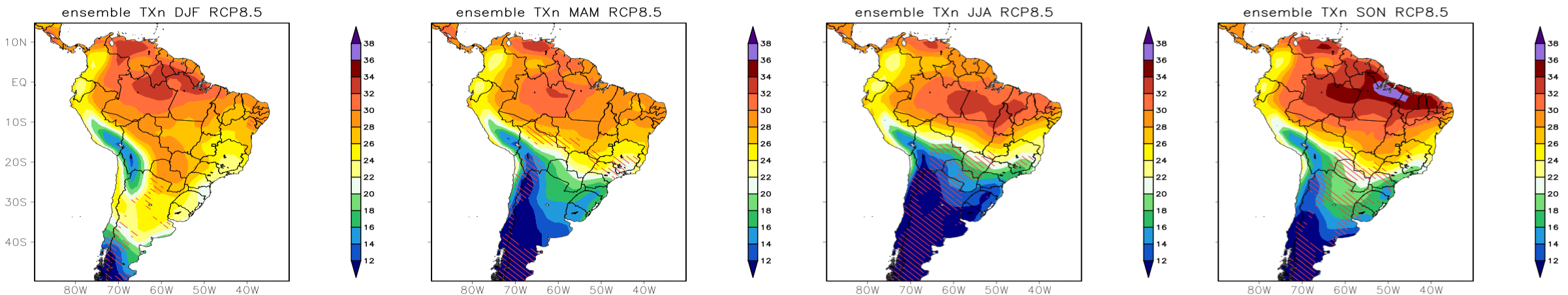
RCP4.5



RCP6.0



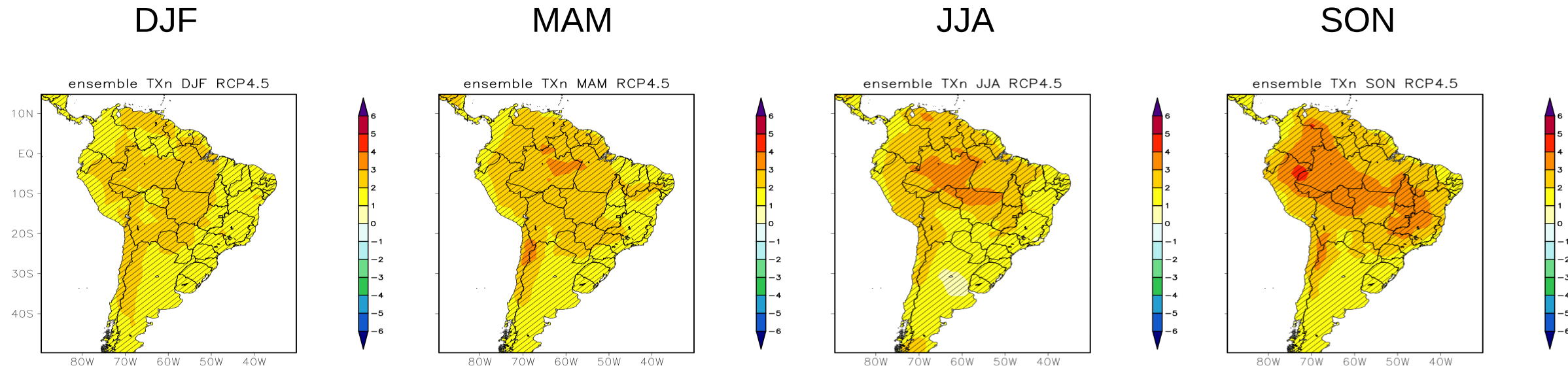
RCP8.5



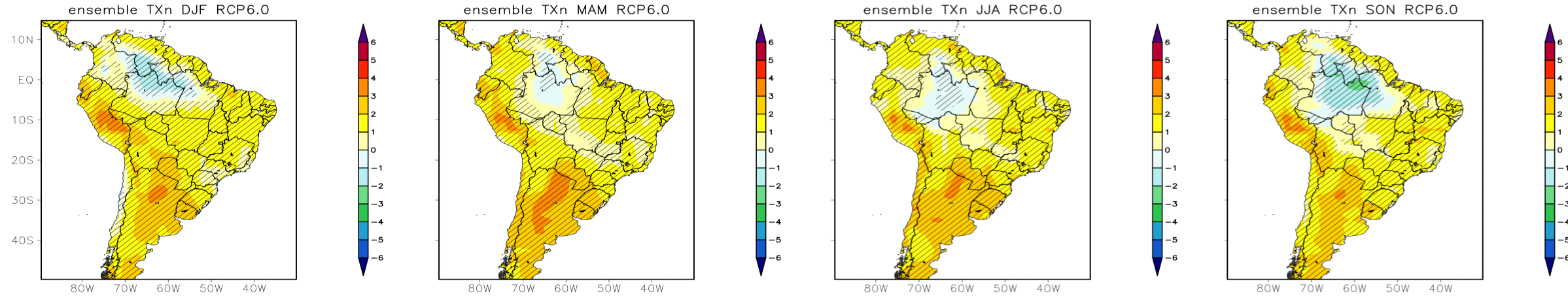
GCMs

ETA

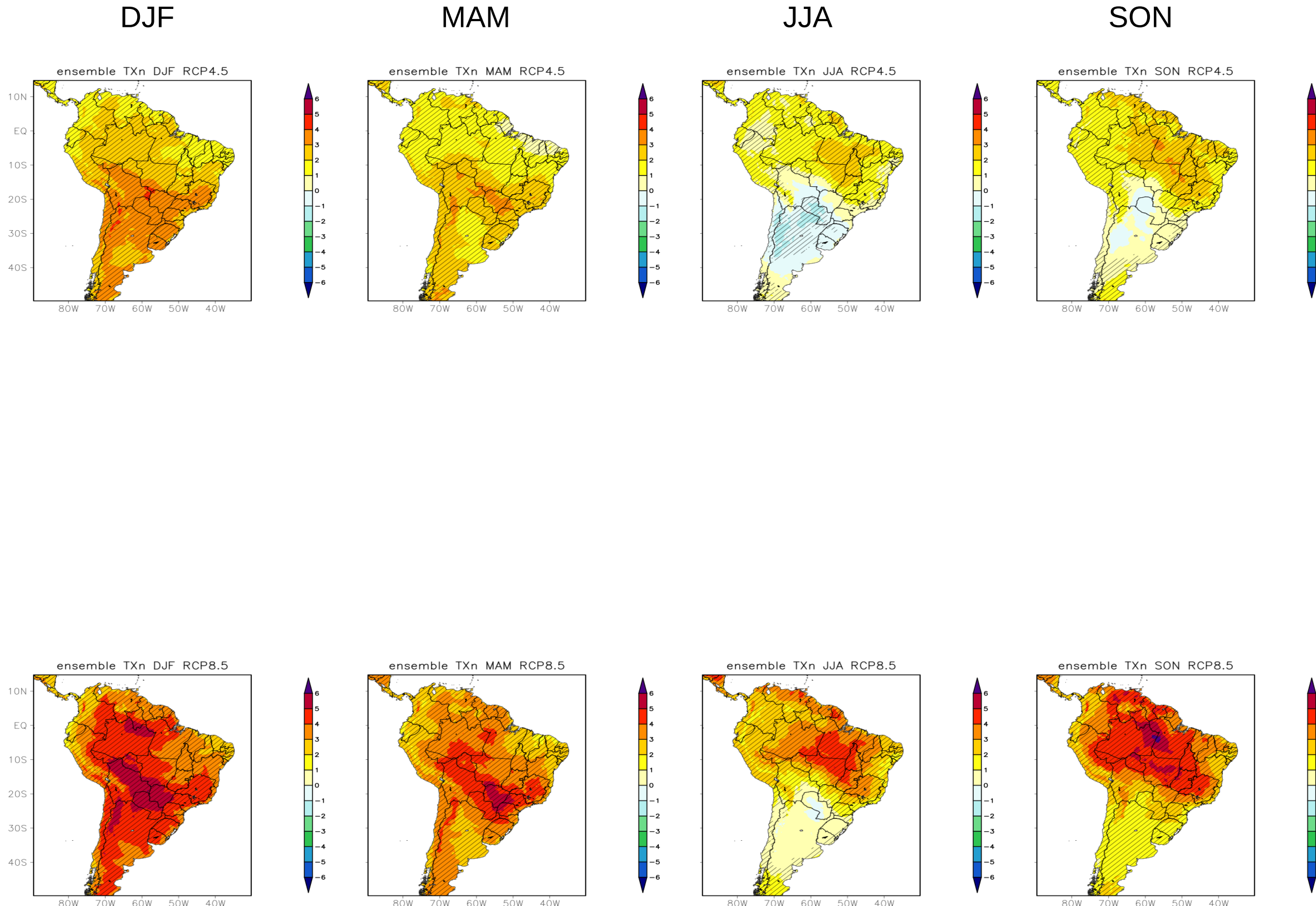
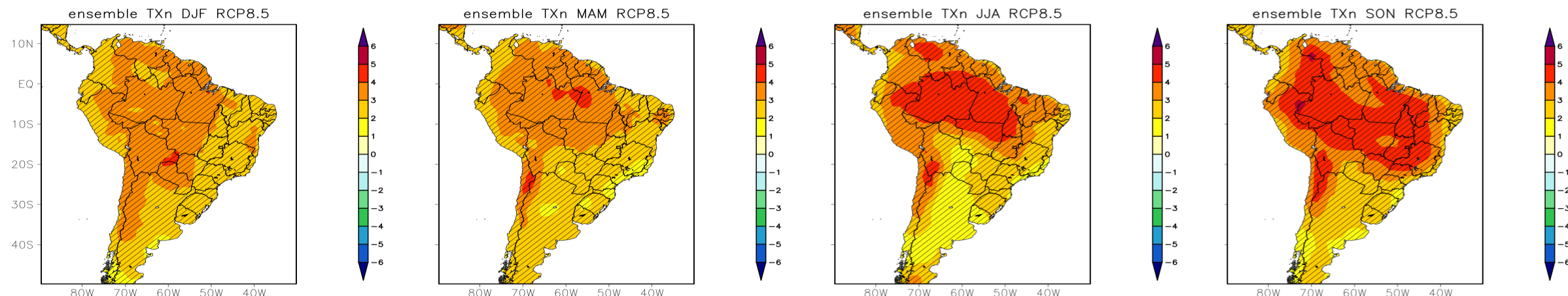
RCP4.5



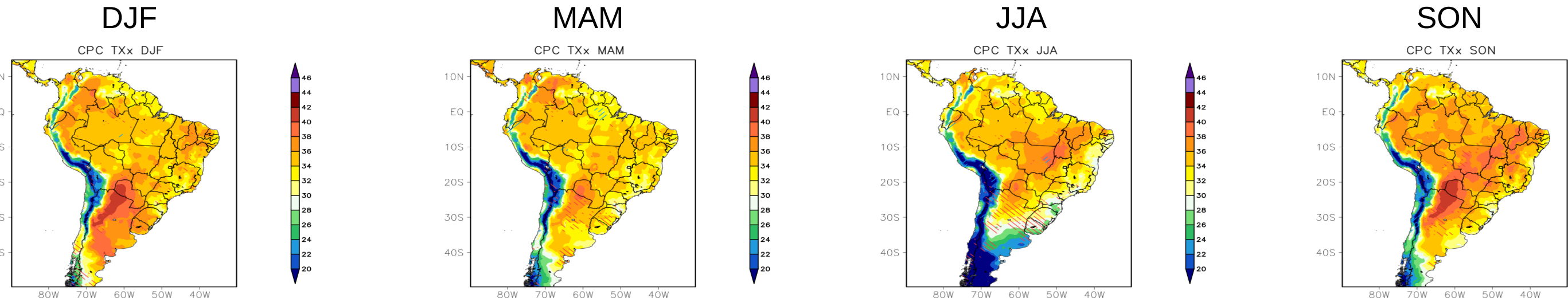
RCP6.0



RCP8.5

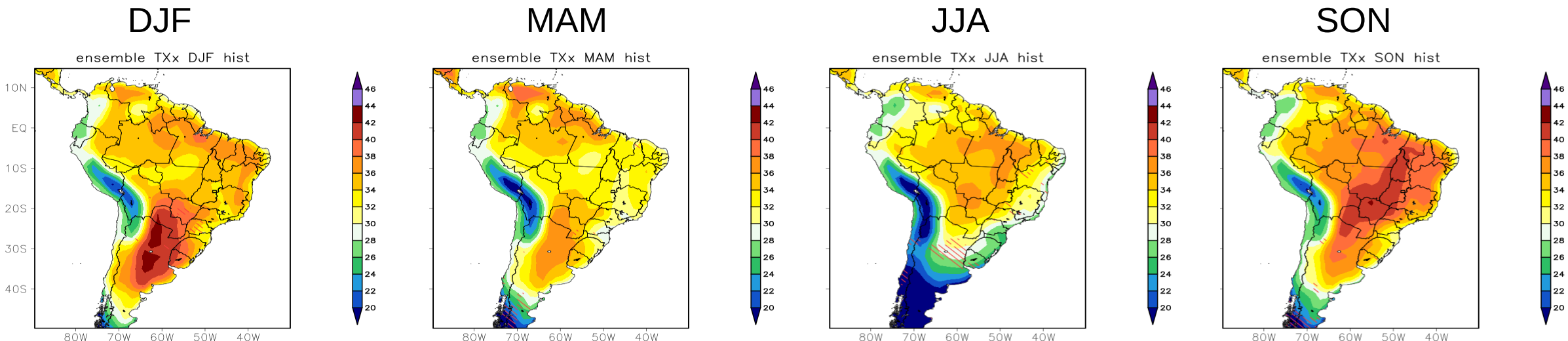


CPC

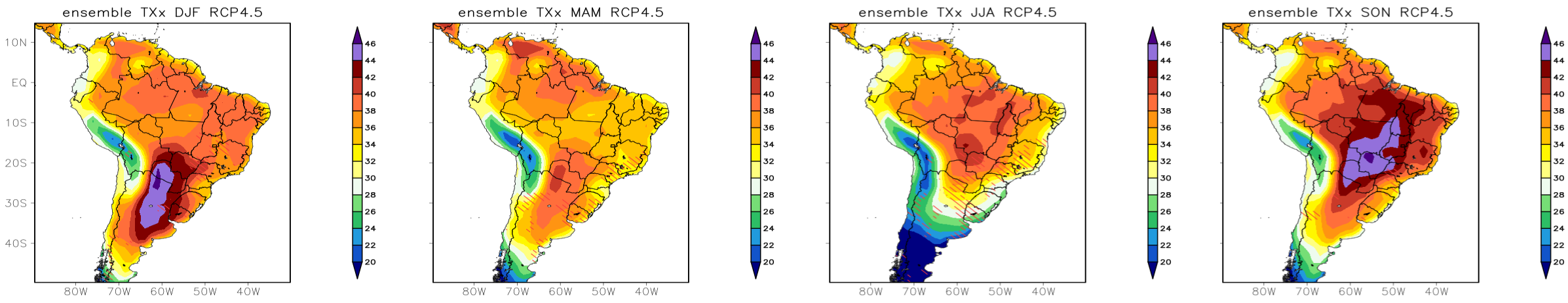


GCMs ETA

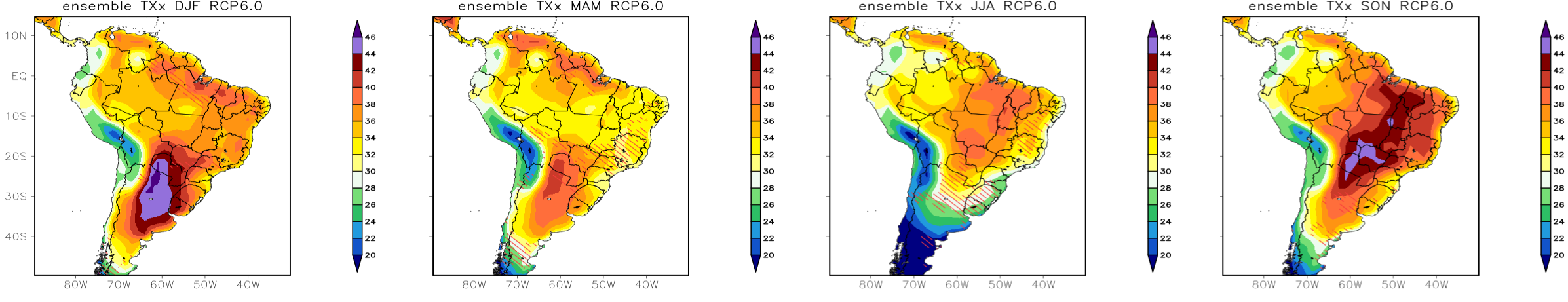
Historical



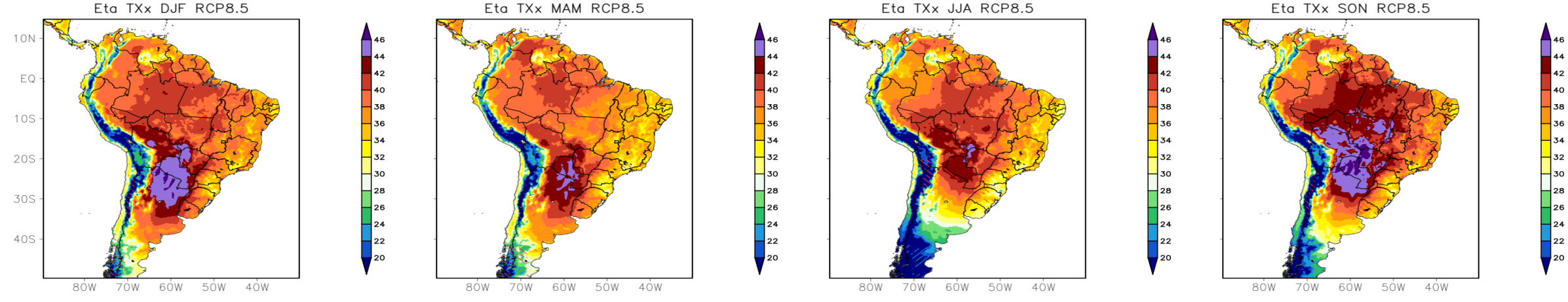
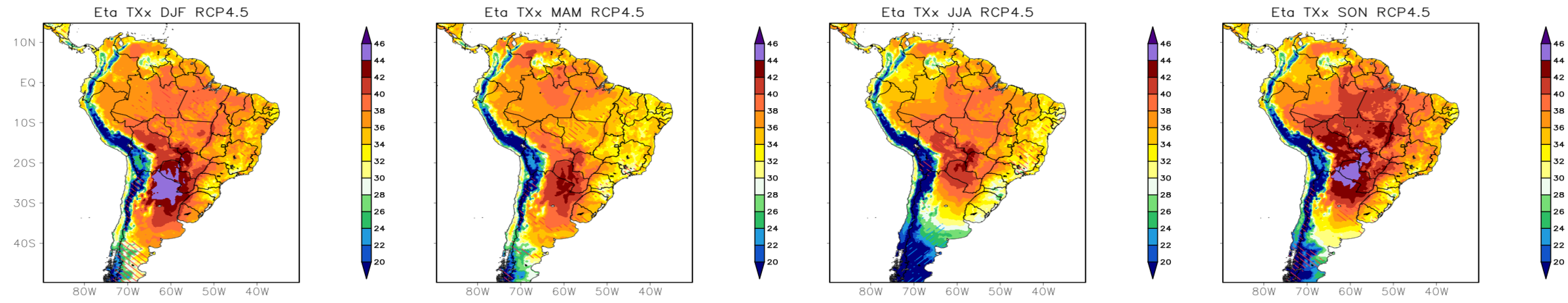
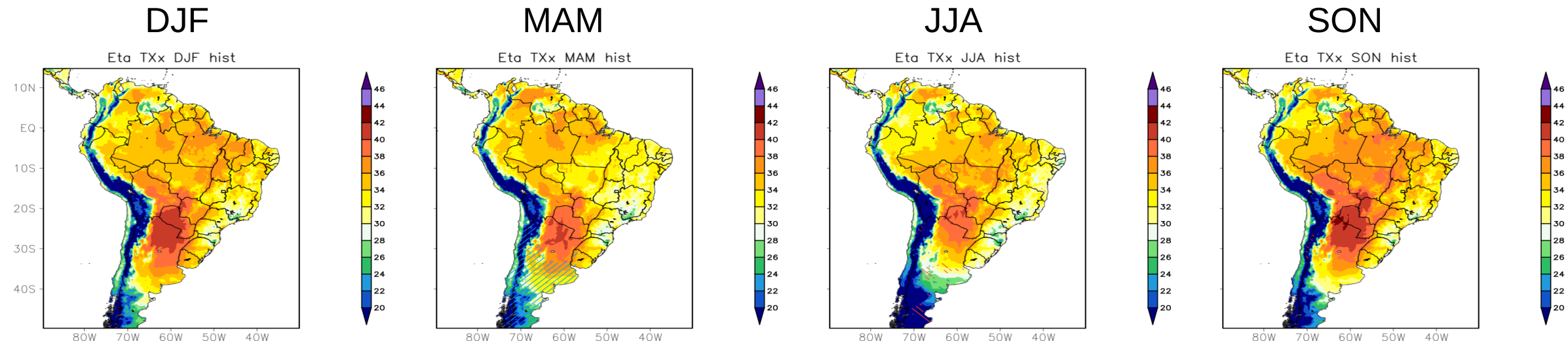
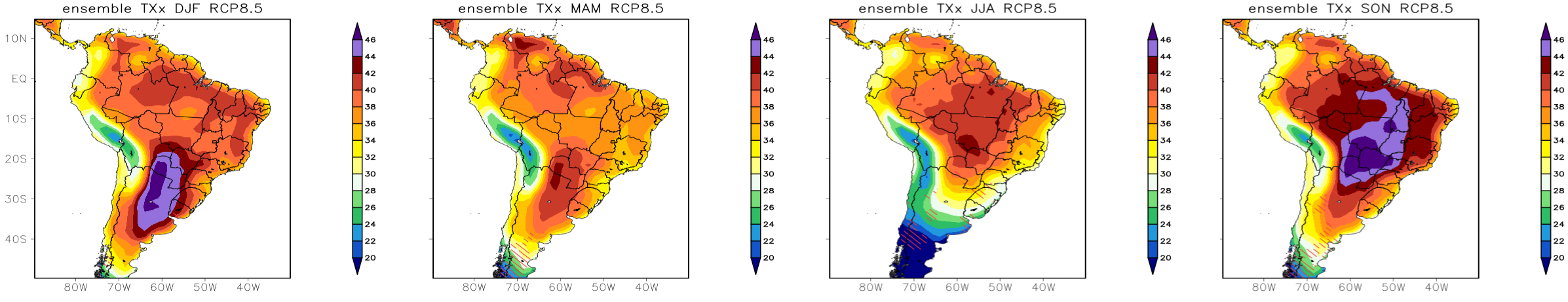
RCP4.5



RCP6.0



RCP8.5



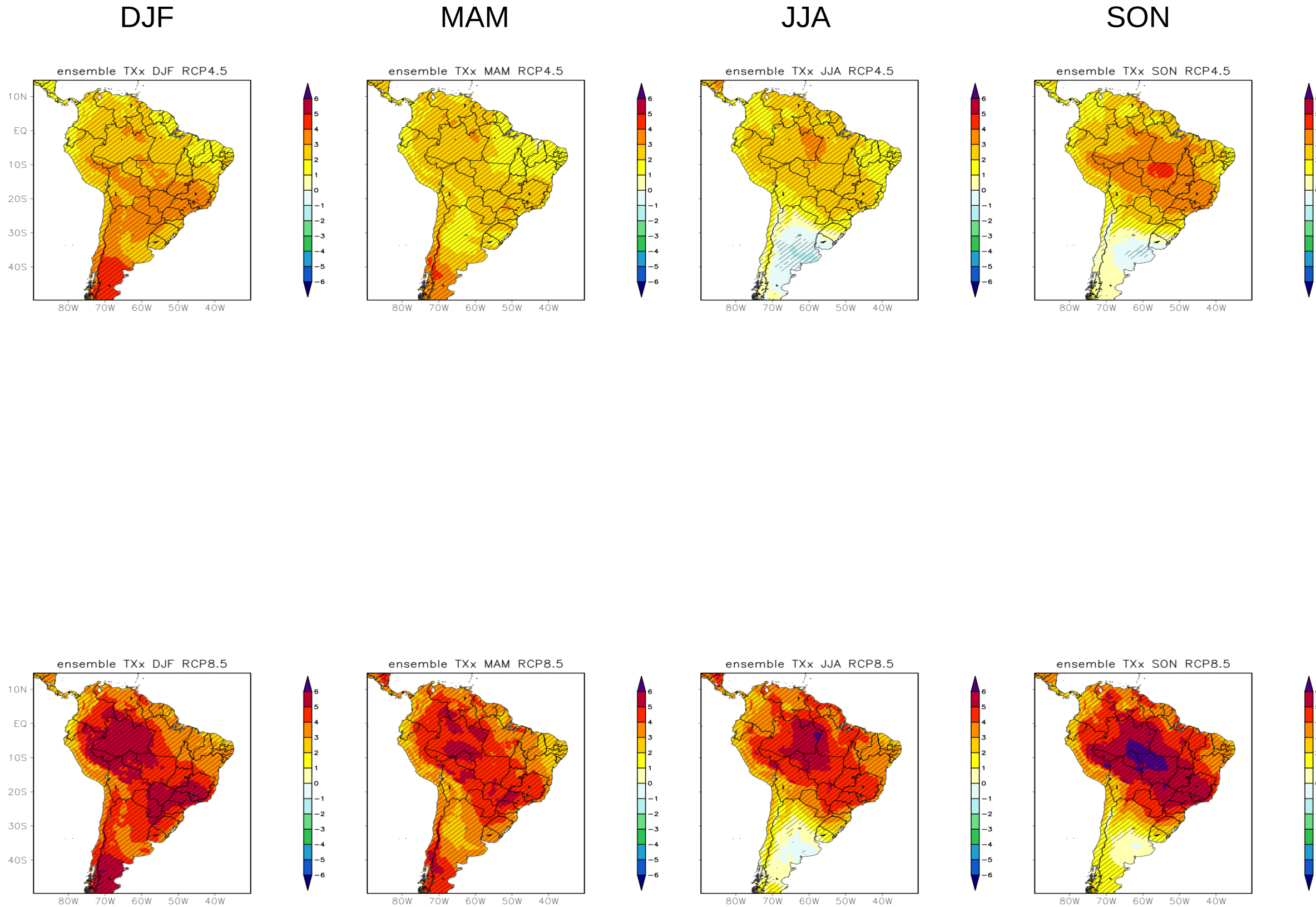
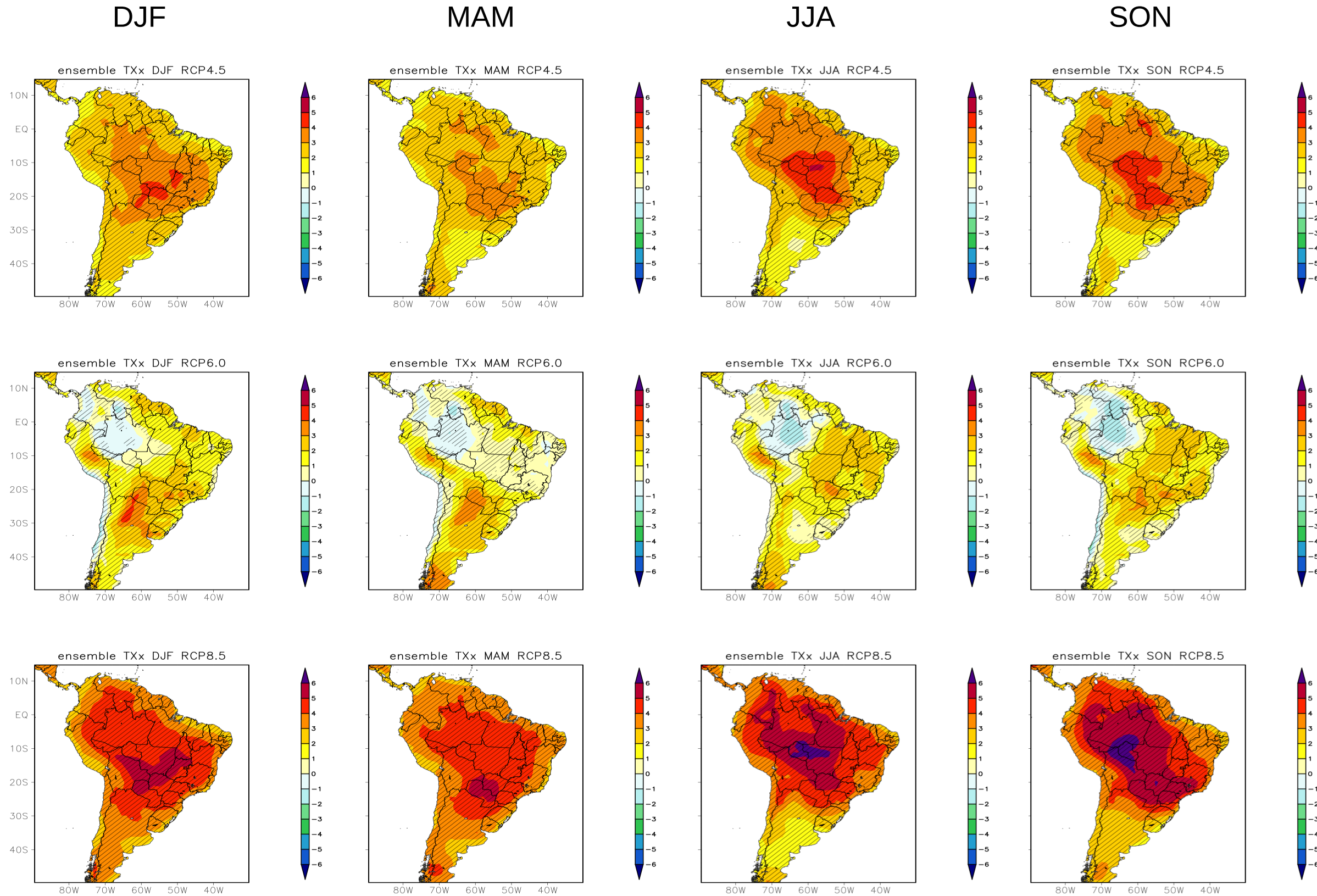
GCMs

ETA

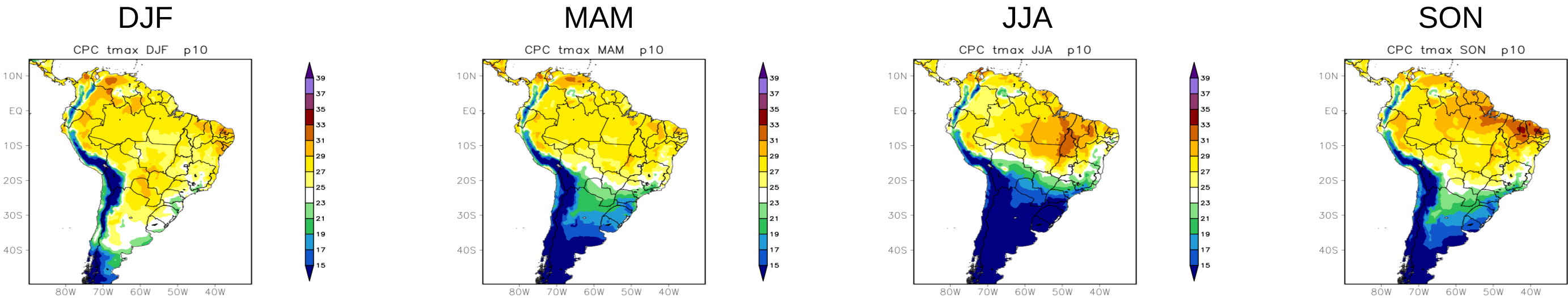
RCP4.5

RCP6.0

RCP8.5



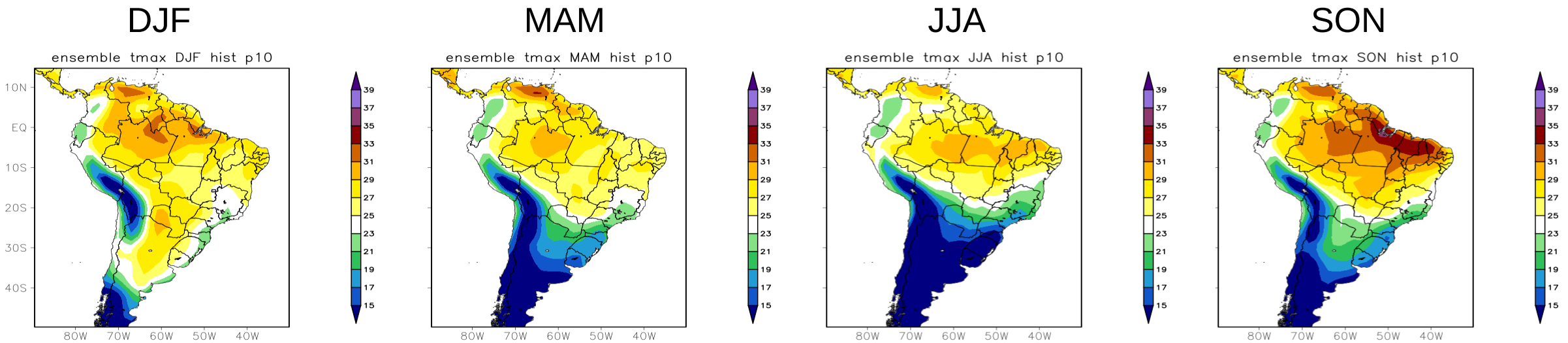
CPC



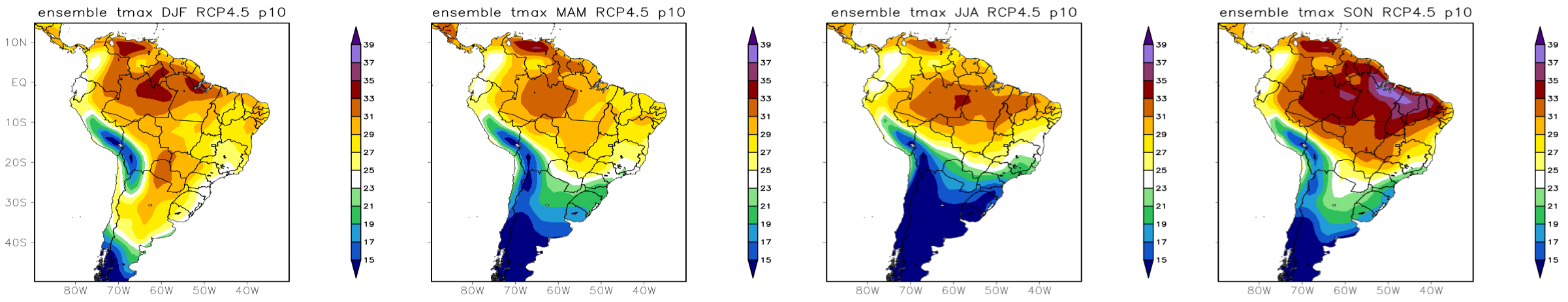
GCMs

ETA

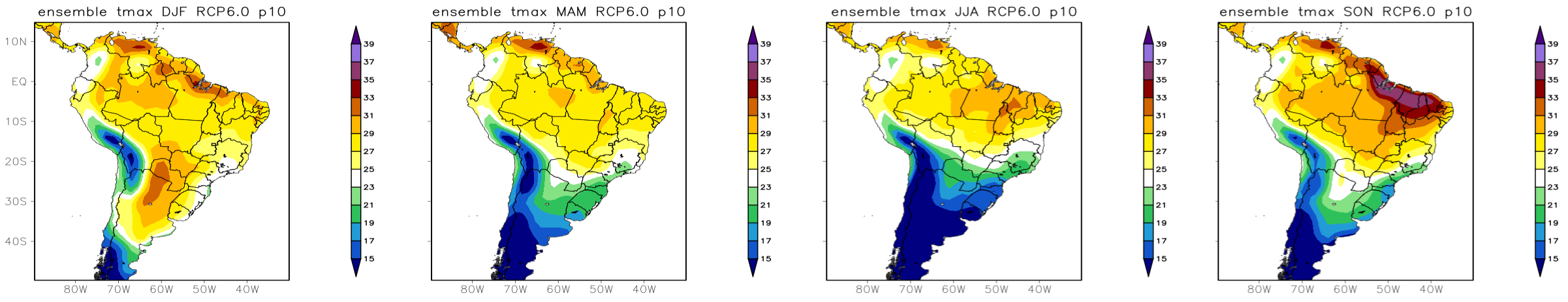
Historical



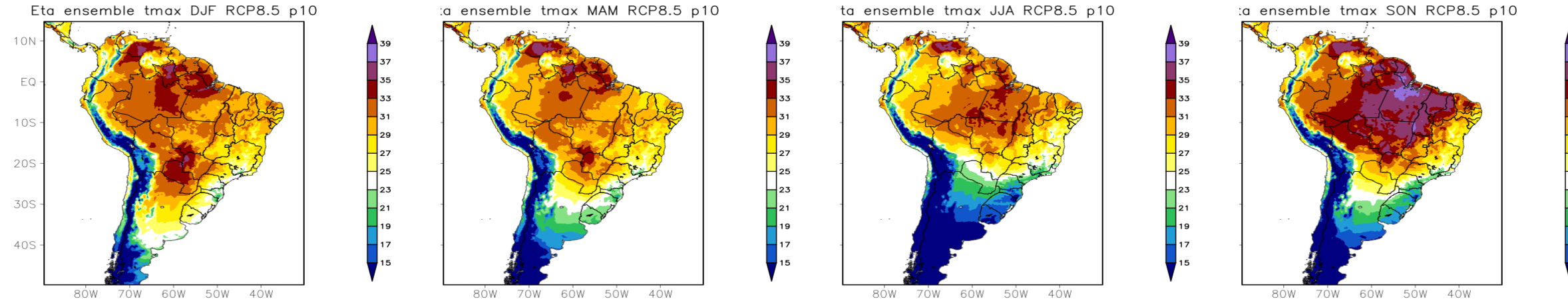
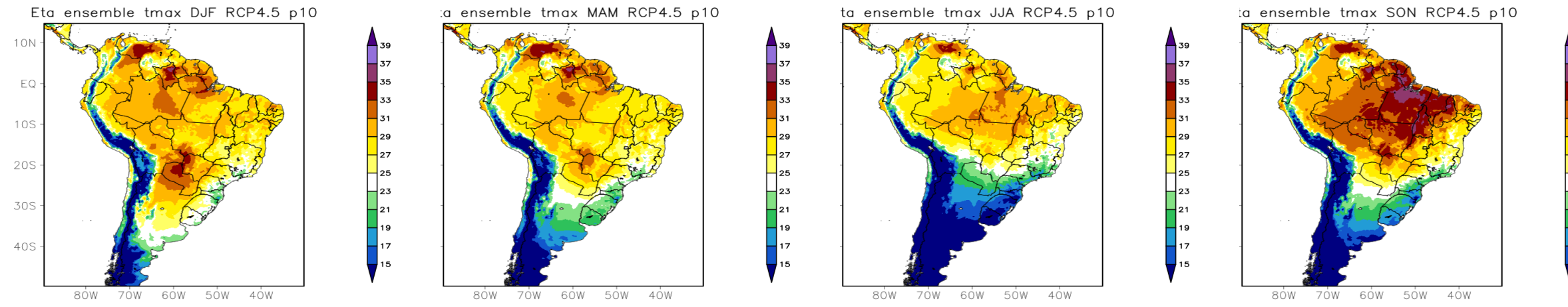
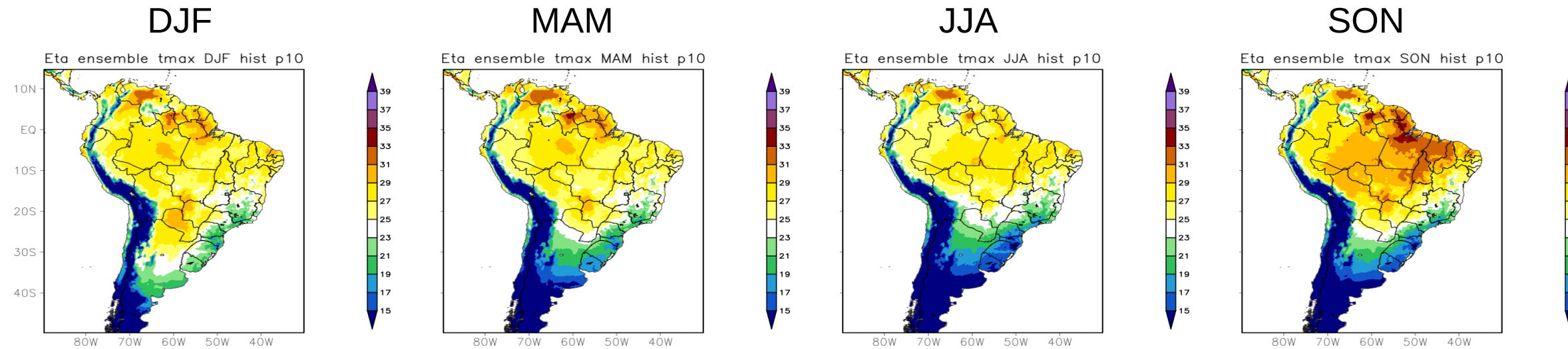
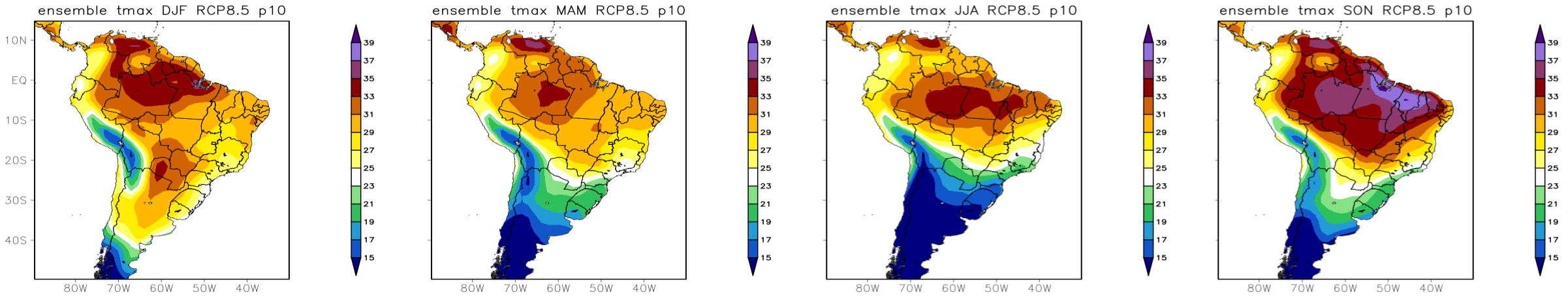
RCP4.5



RCP6.0



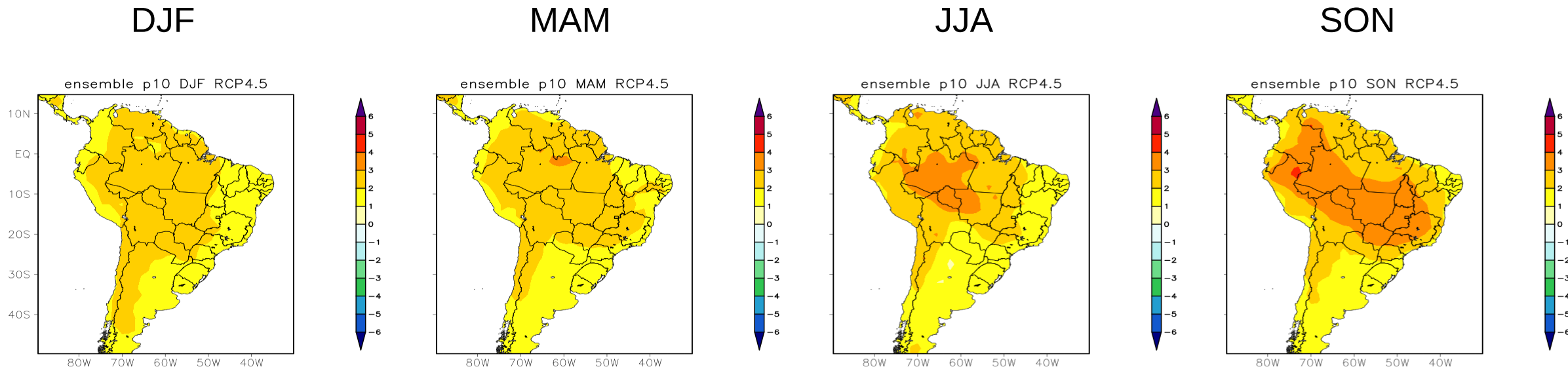
RCP8.5



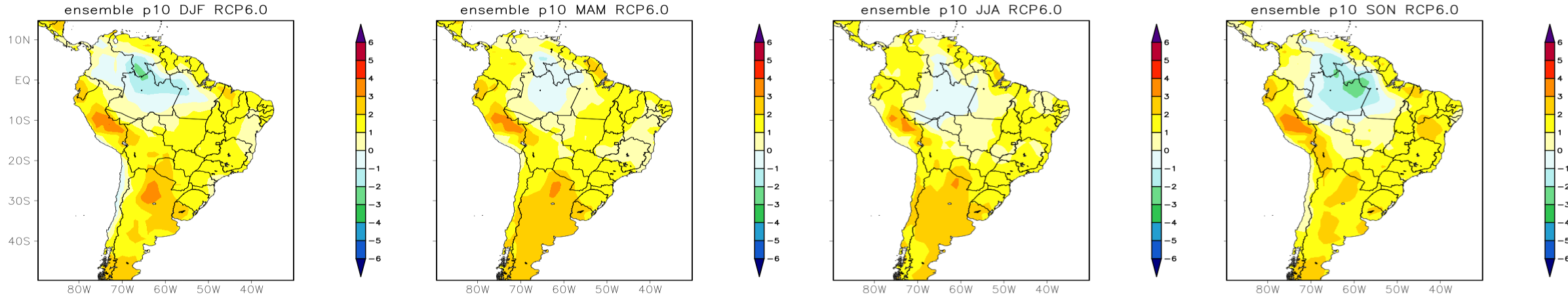
GCMs

ETA

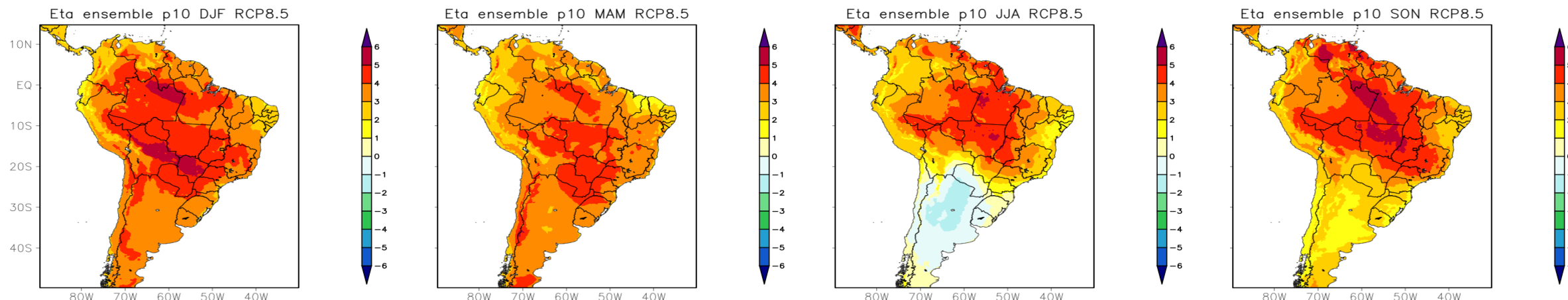
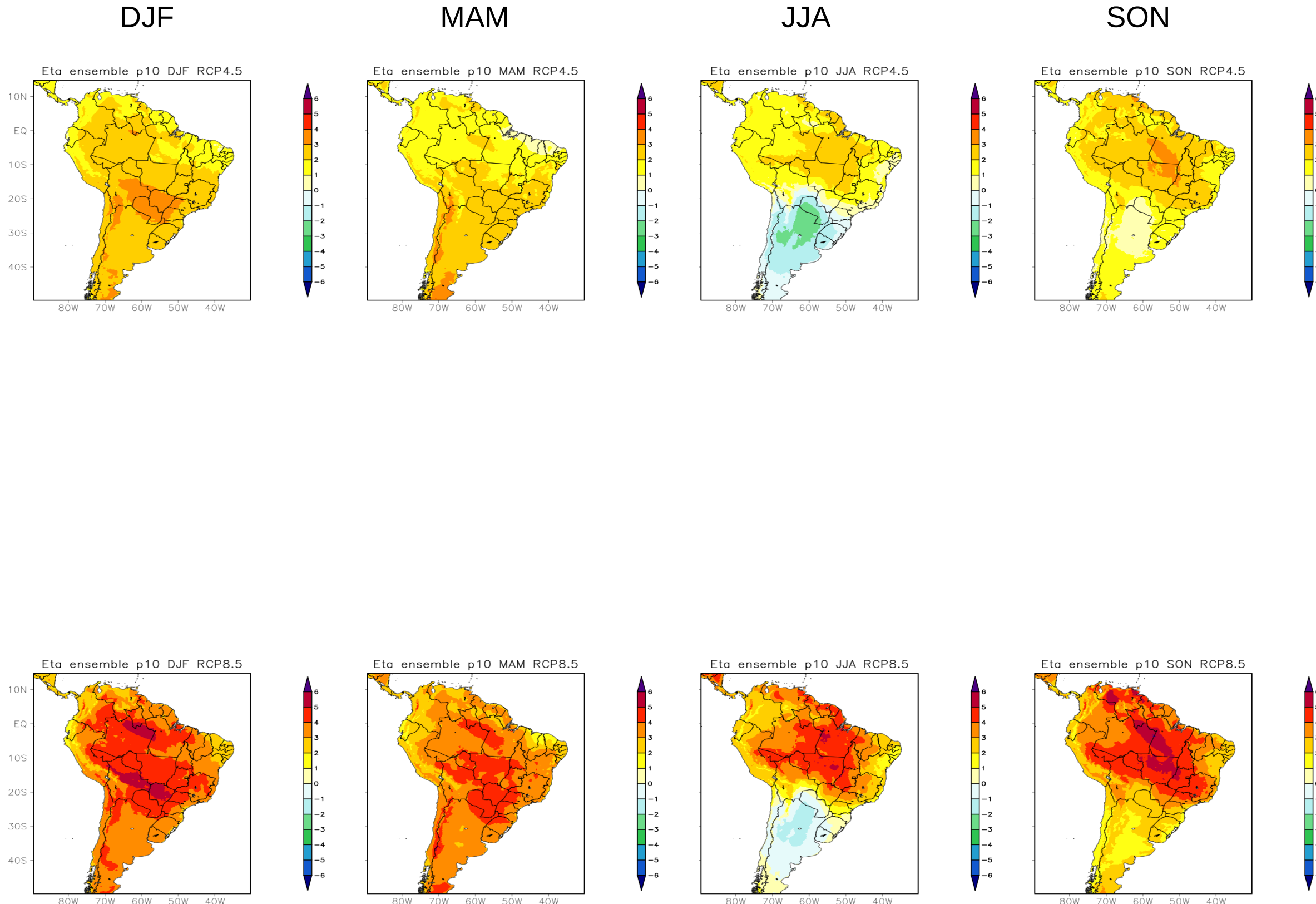
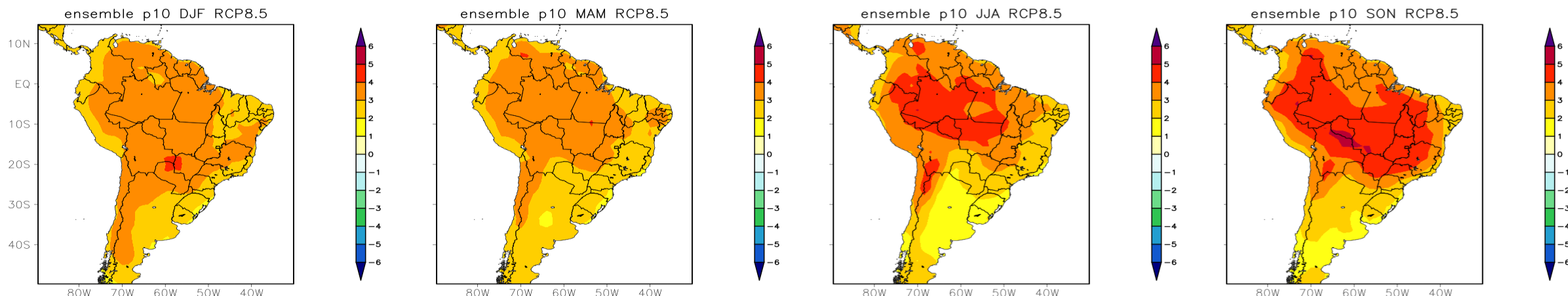
RCP4.5



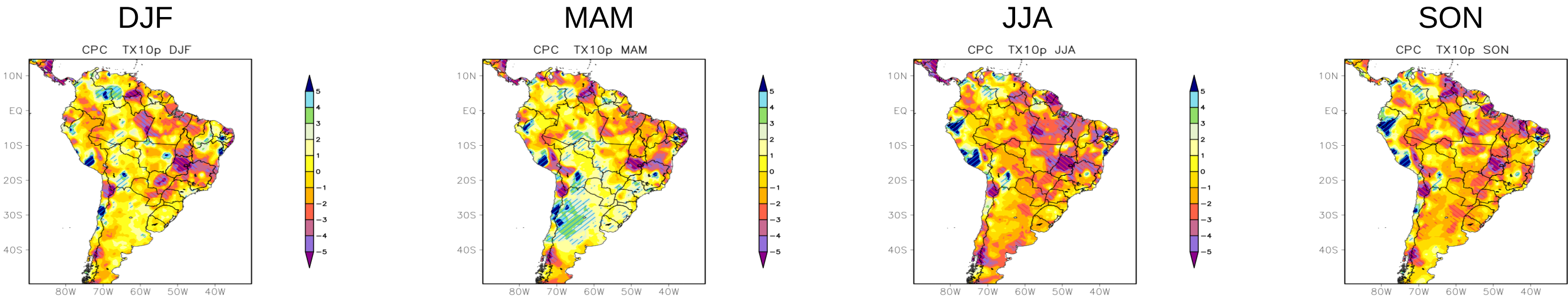
RCP6.0



RCP8.5



CPC

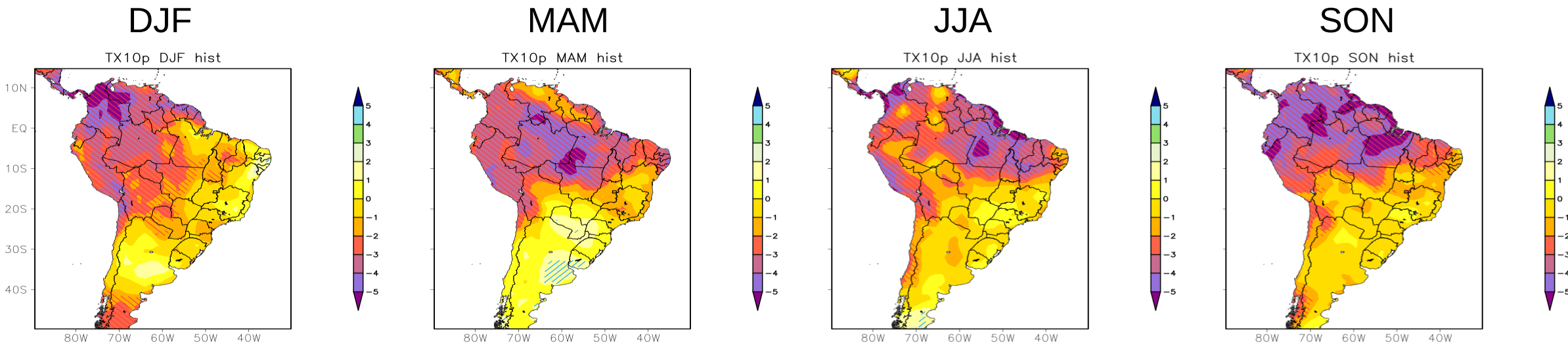


No CPC é apresentada a tendência do TX10p enquanto no futuro é a porcentagem de dias com base no percentil do presente

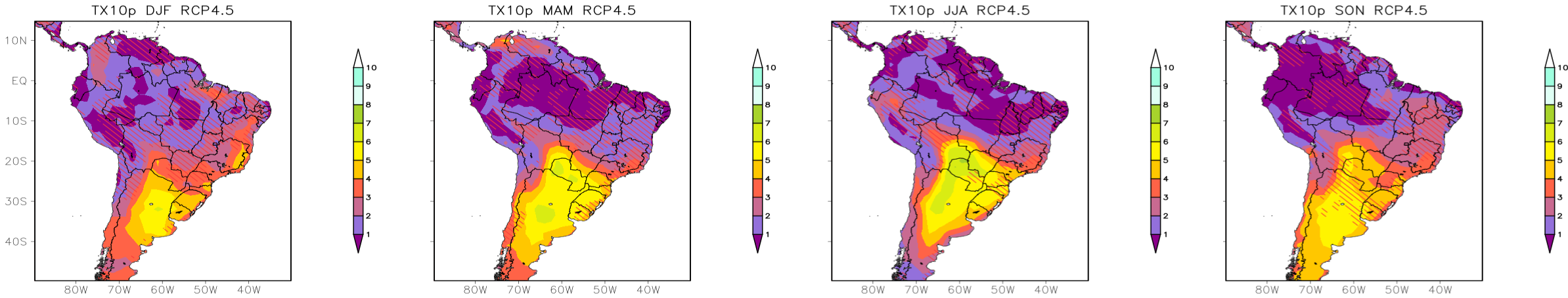
GCMs

ETA

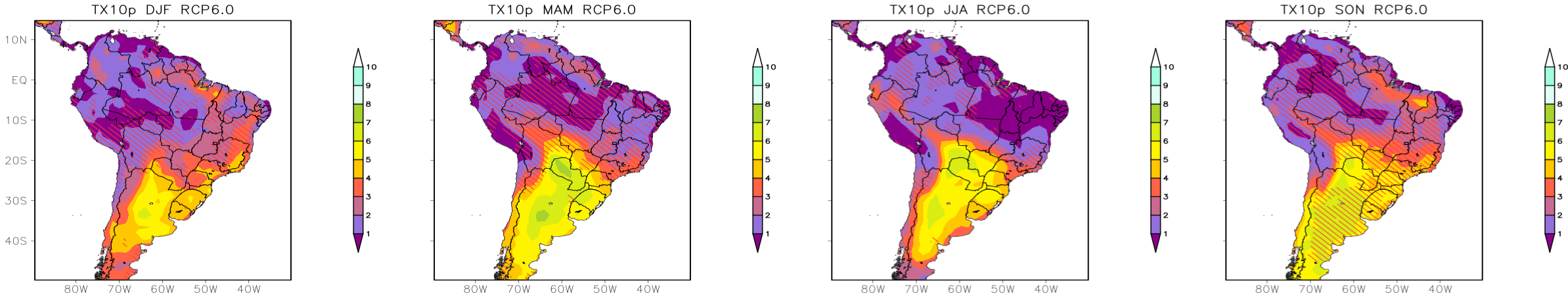
Historical



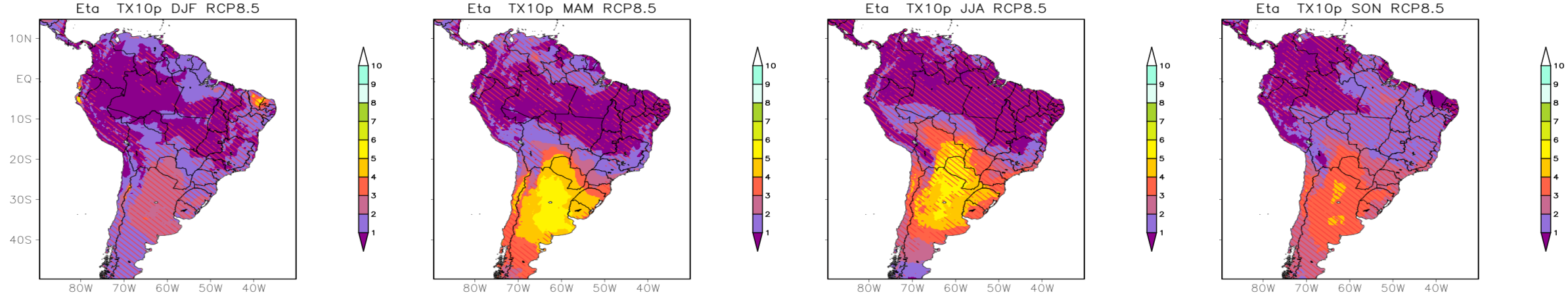
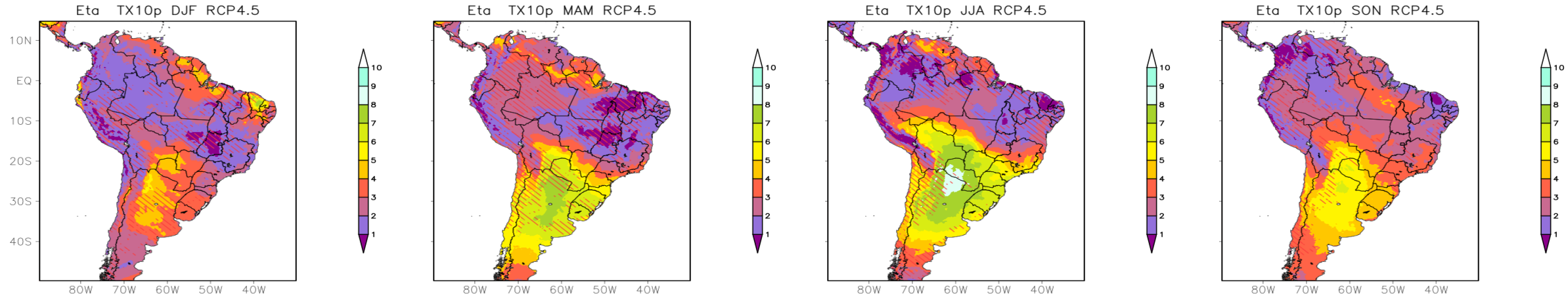
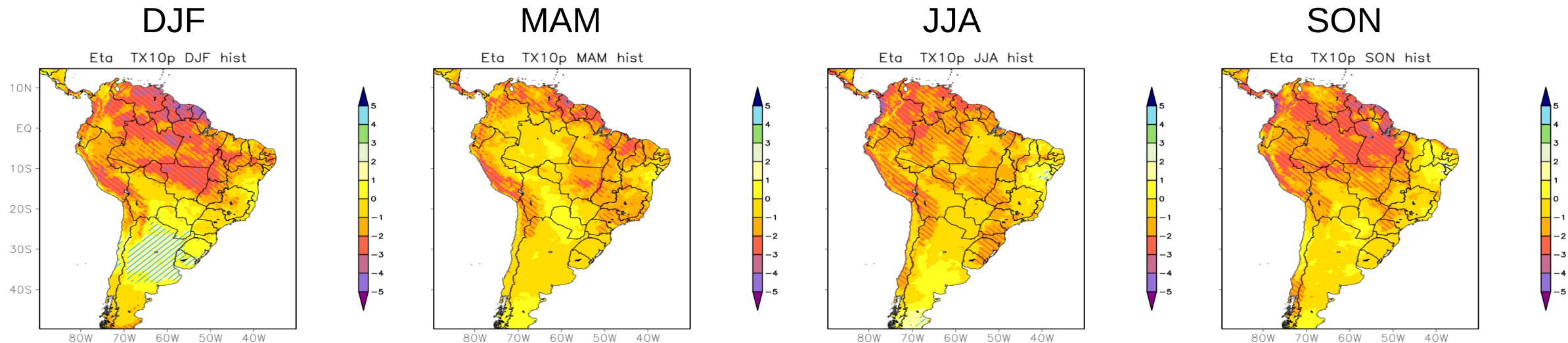
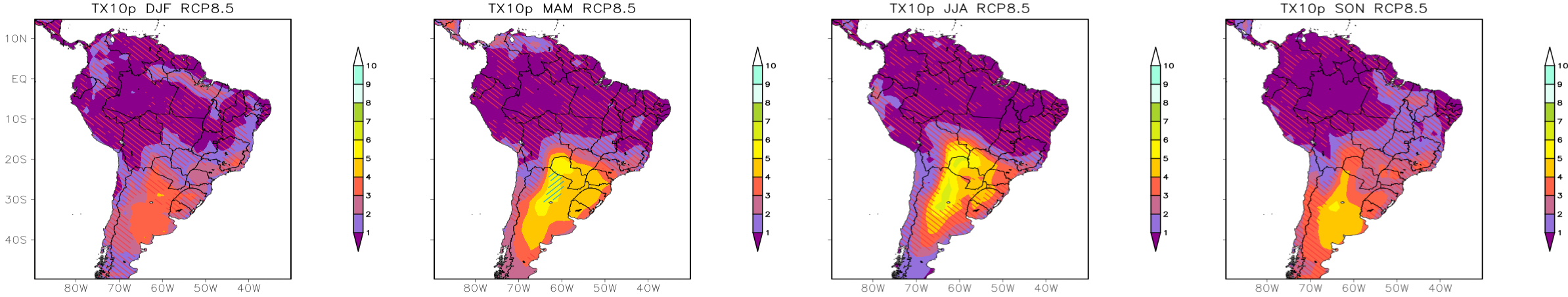
RCP4.5



RCP6.0



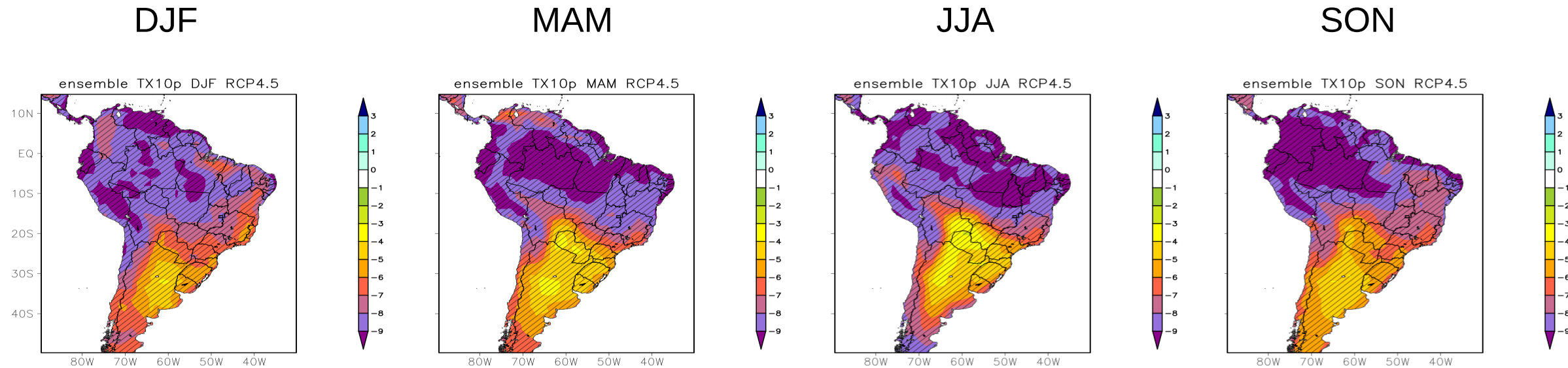
RCP8.5



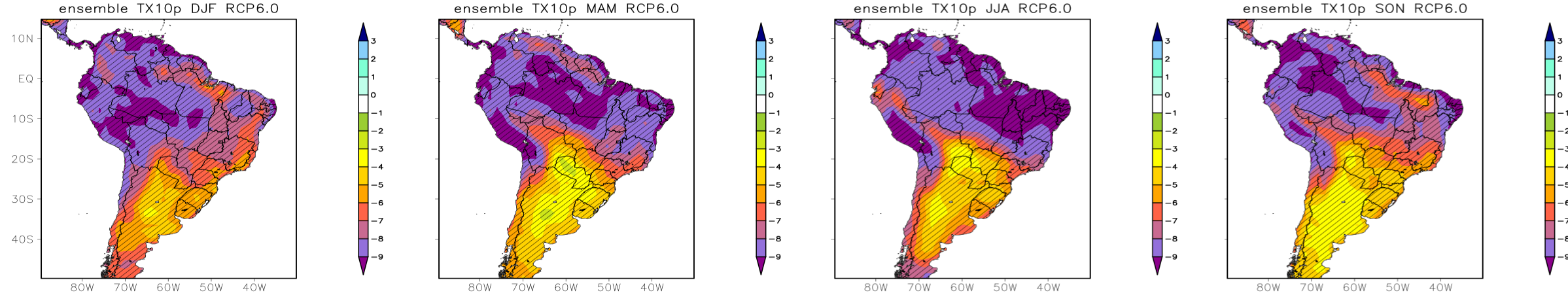
GCMs

ETA

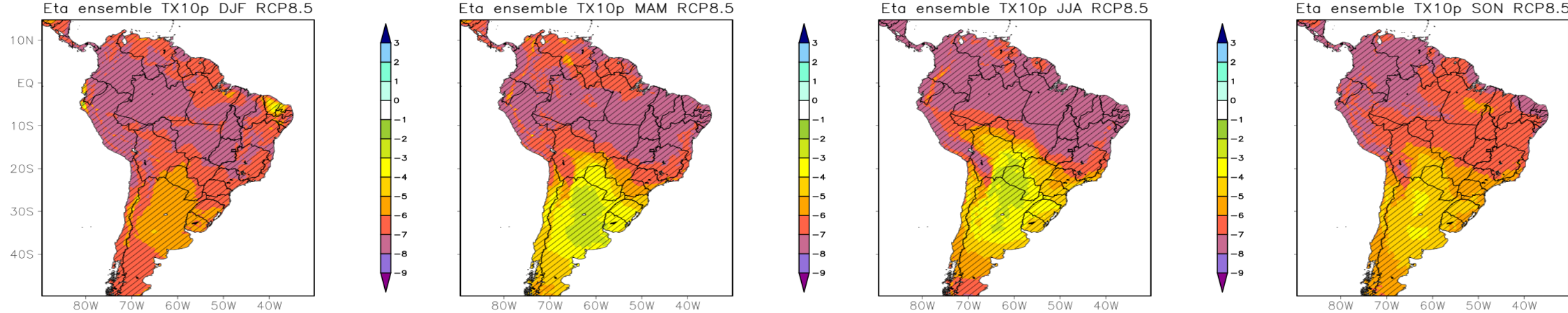
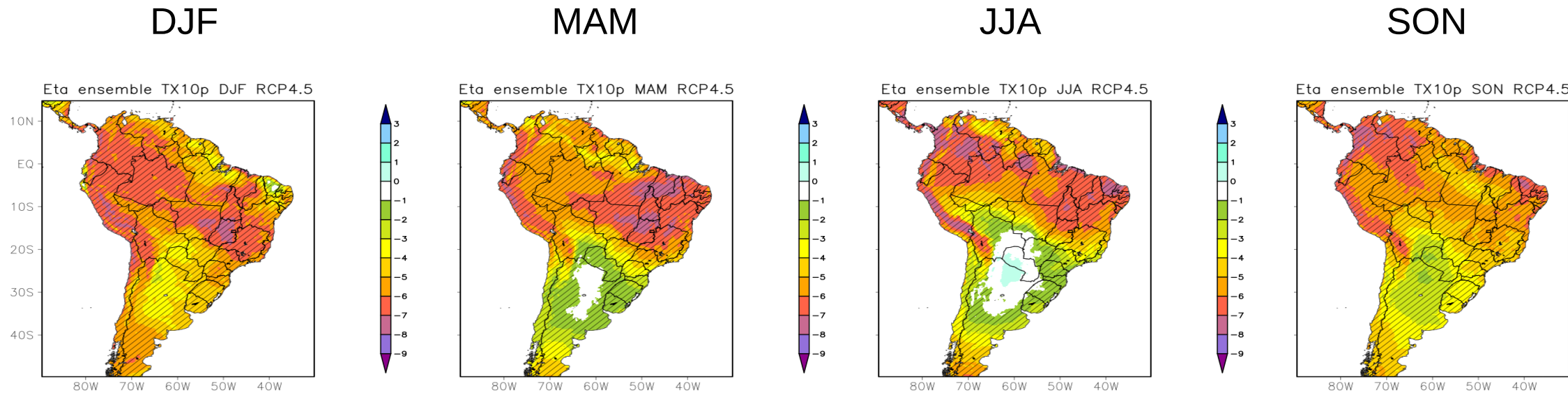
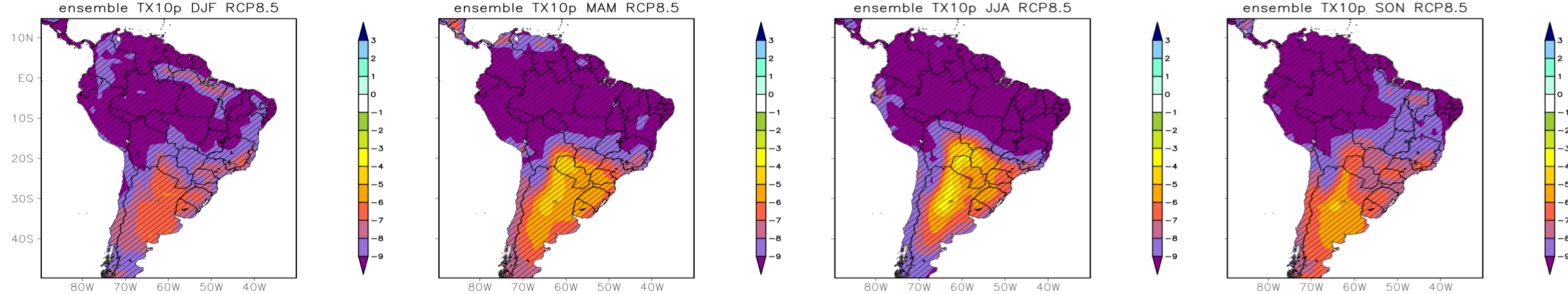
RCP4.5



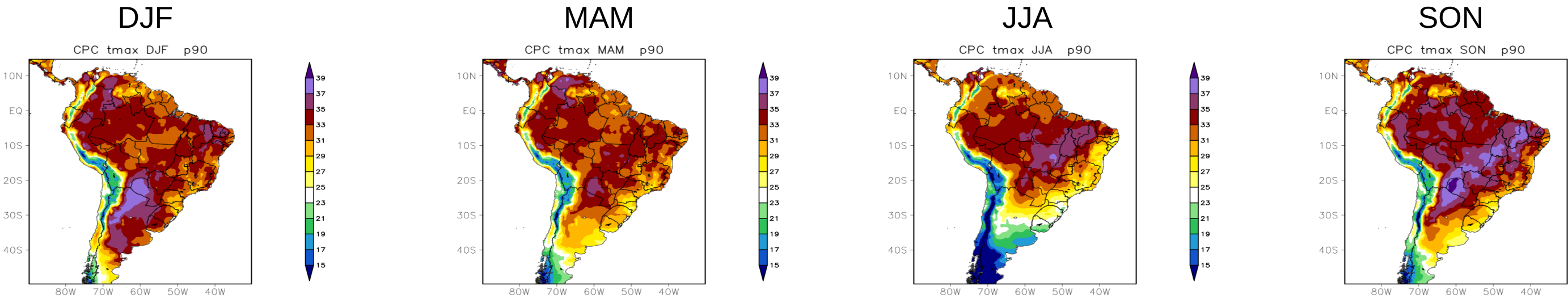
RCP6.0



RCP8.5

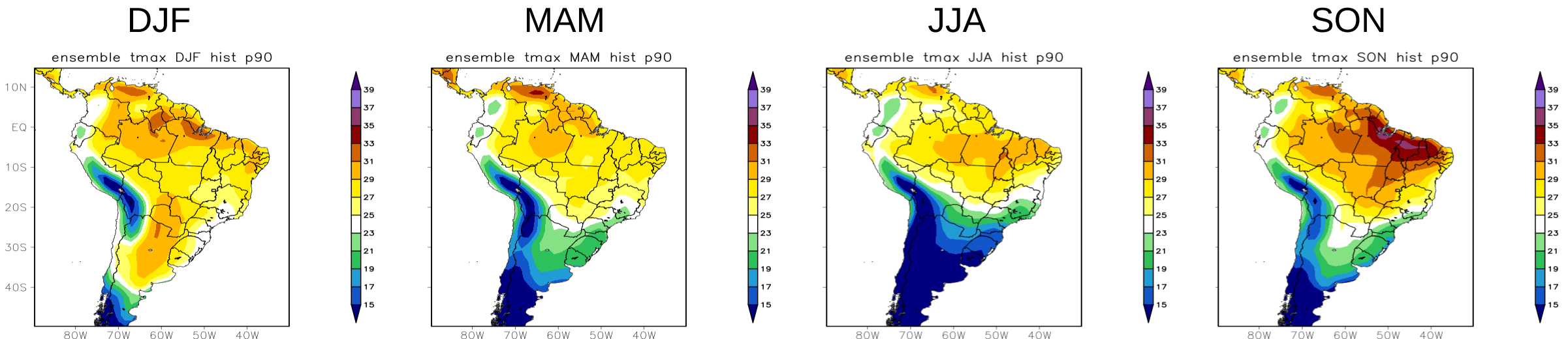


CPC

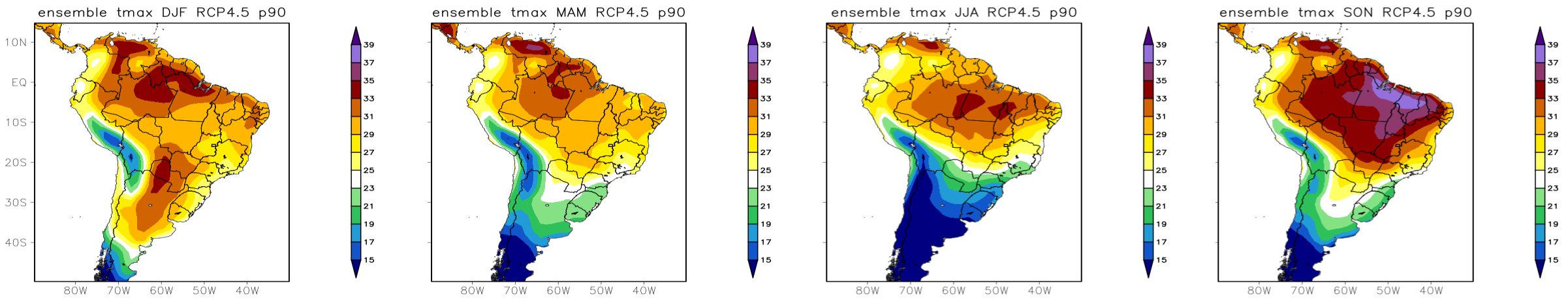


GCMs ETA

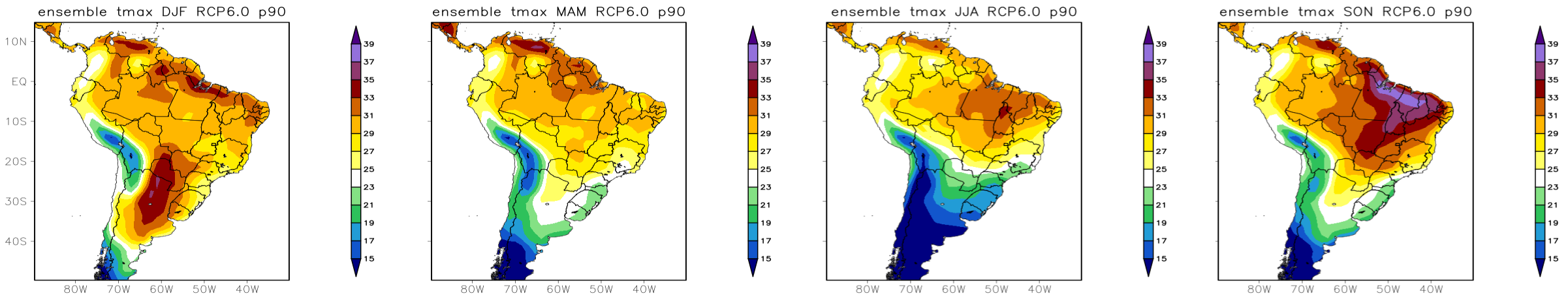
Historical



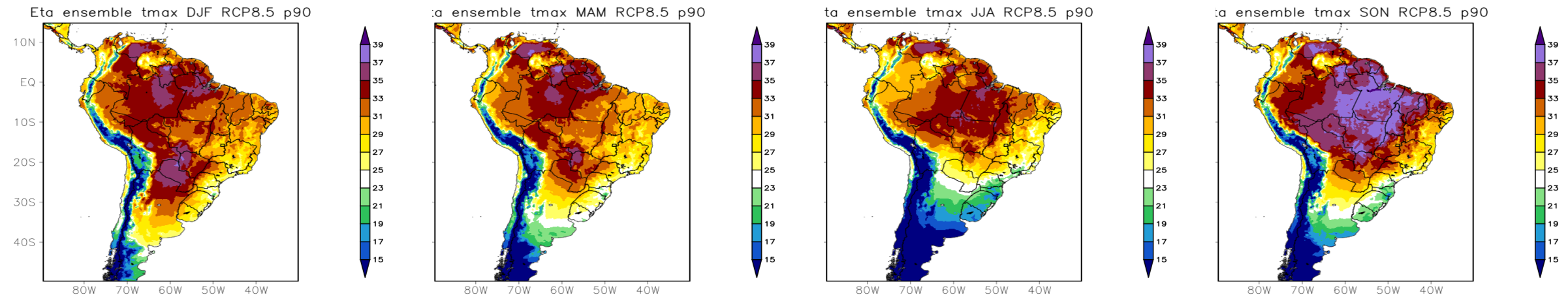
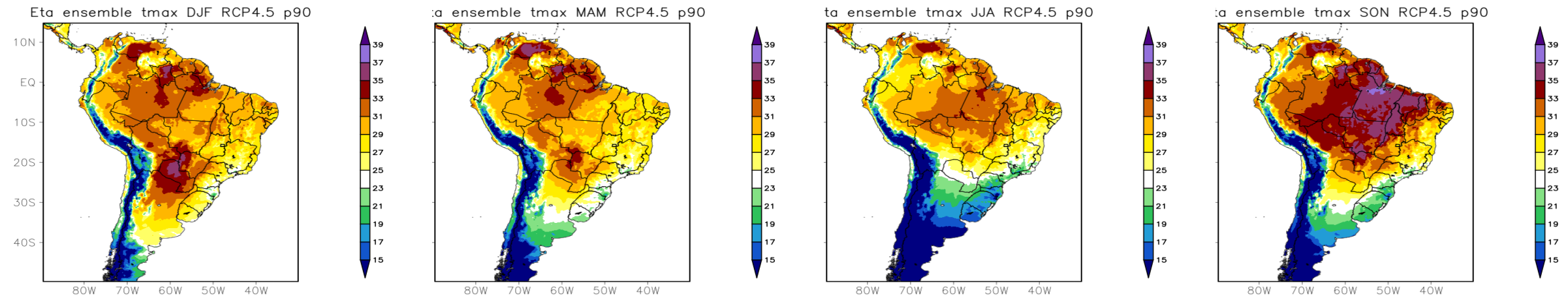
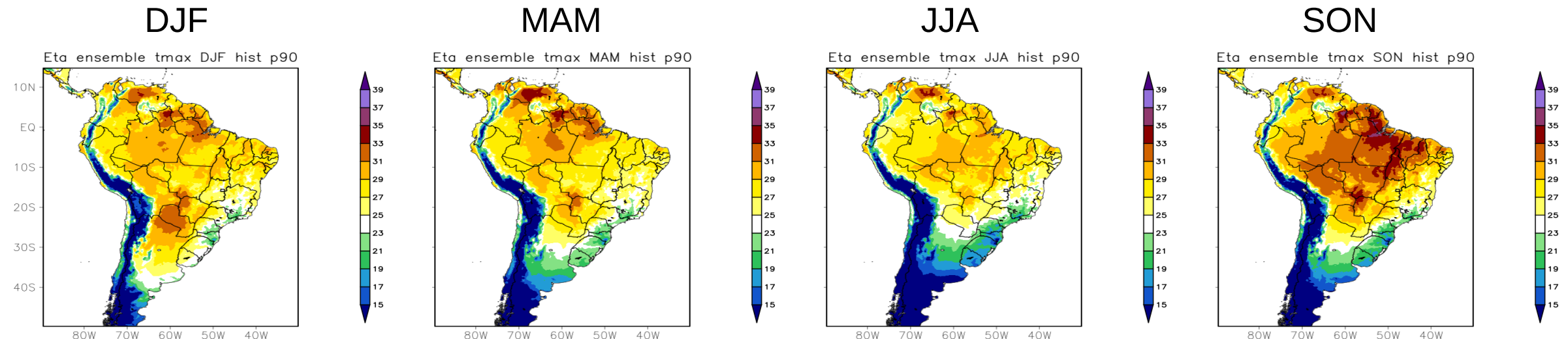
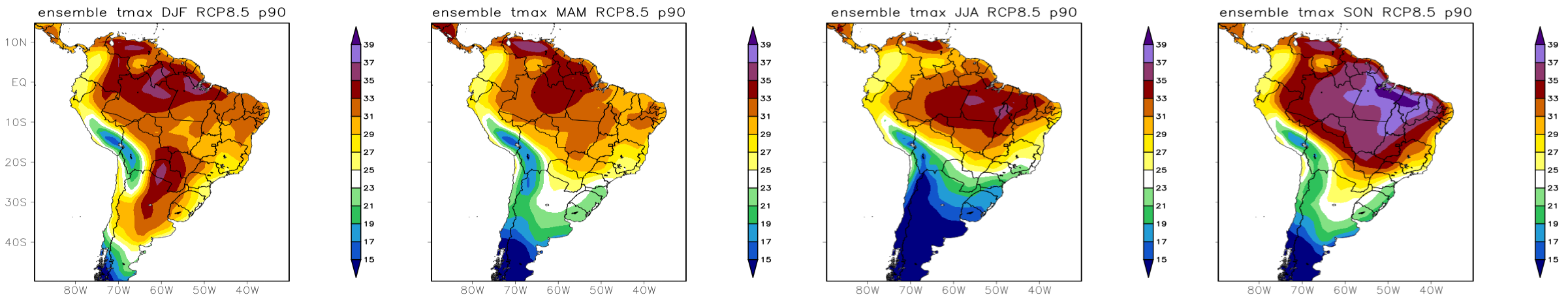
RCP4.5



RCP6.0



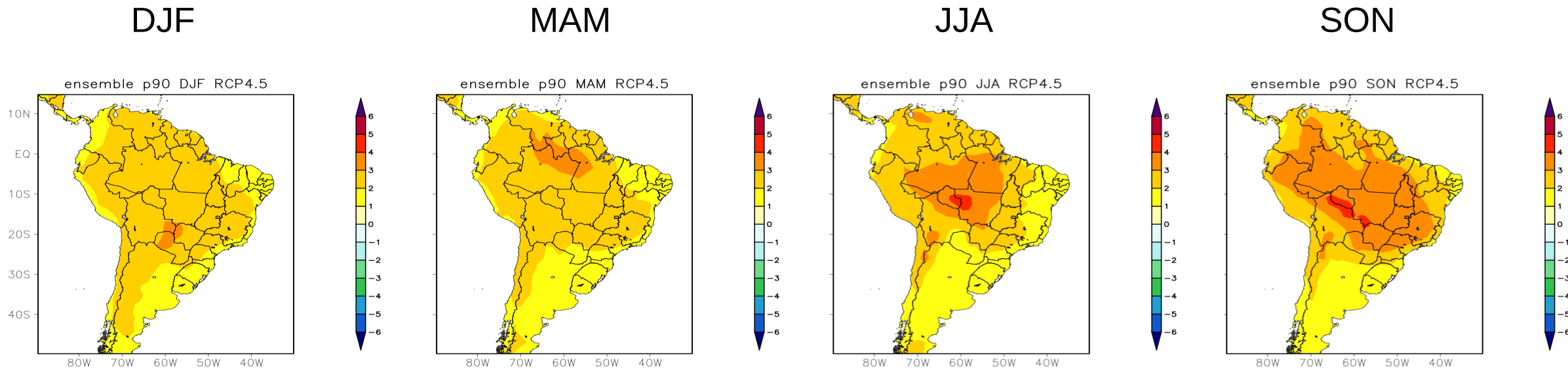
RCP8.5



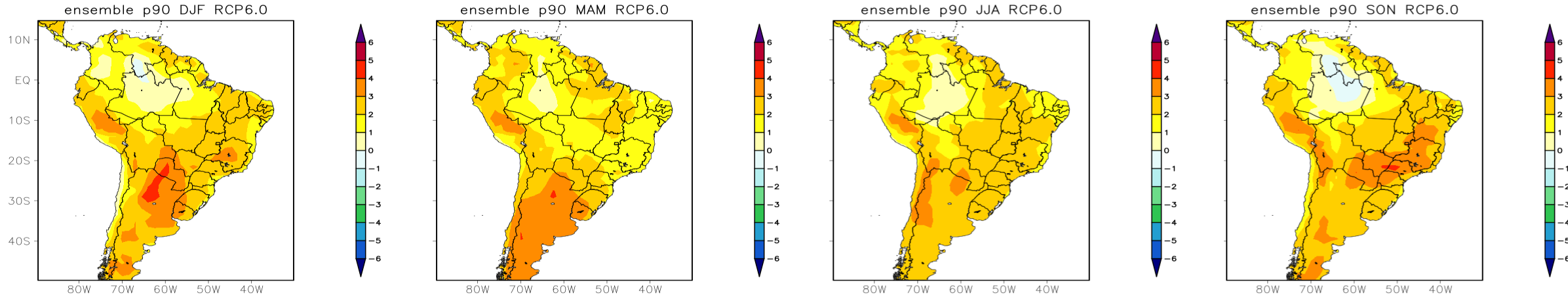
GCMs

ETA

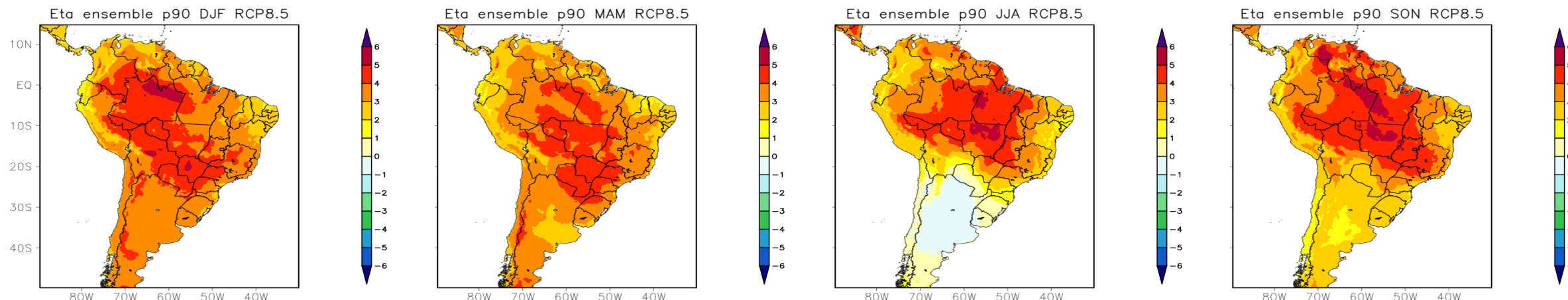
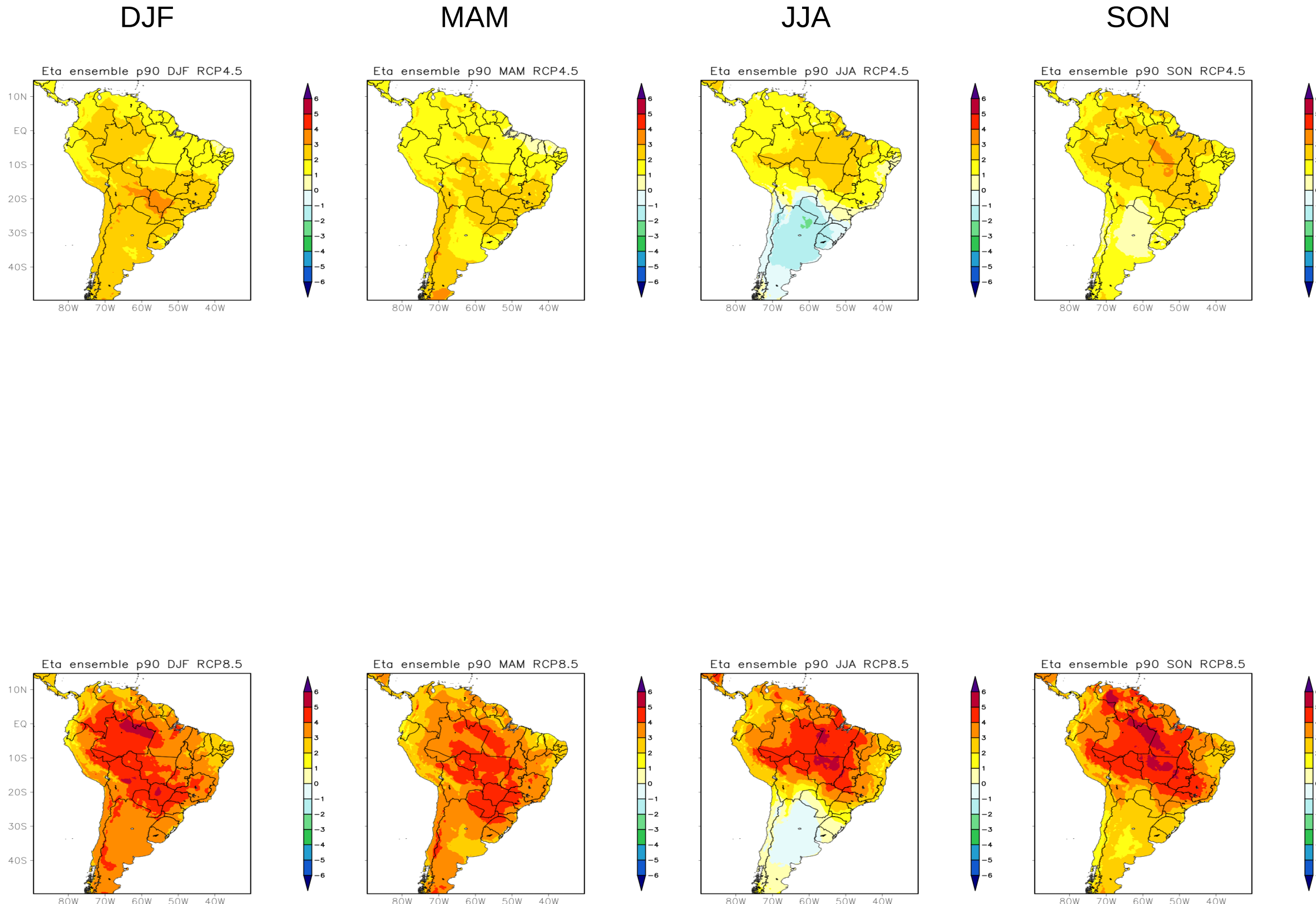
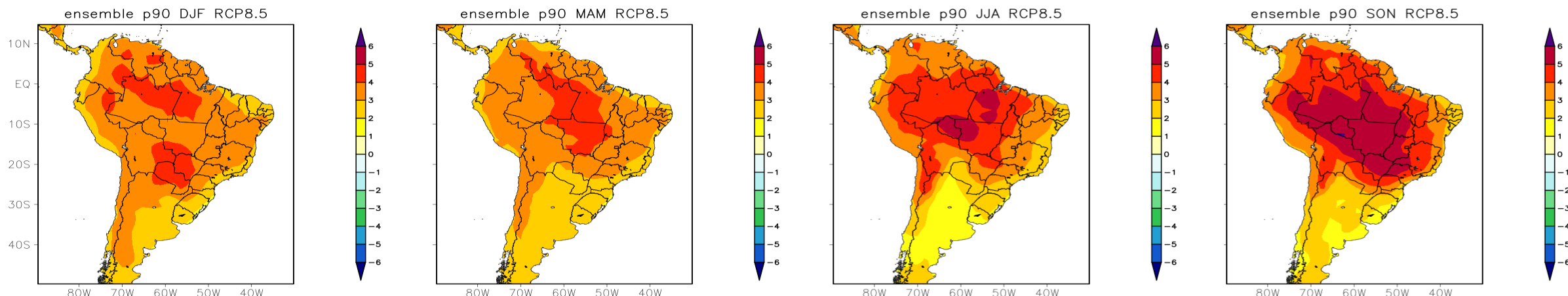
RCP4.5



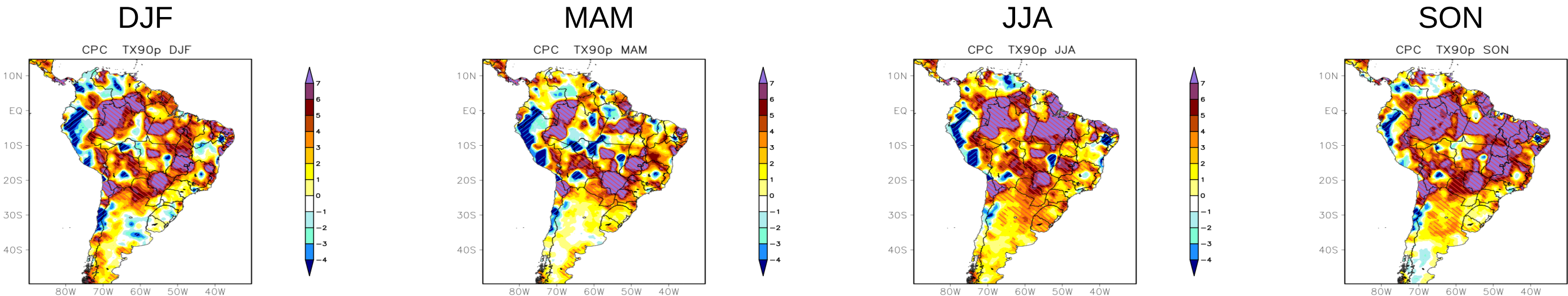
RCP6.0



RCP8.5



CPC

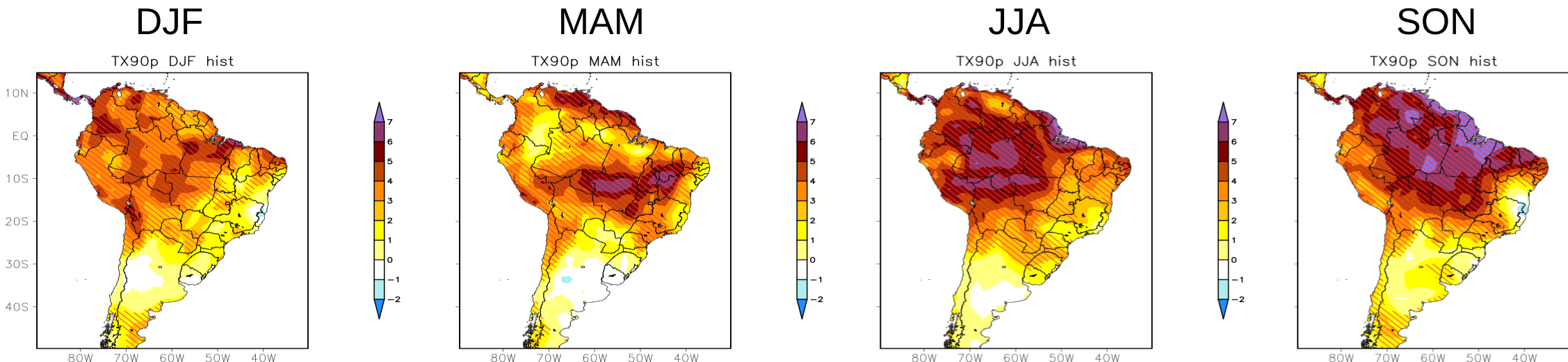


No CPC é apresentada a tendência do TX90p enquanto no futuro é a porcentagem de dias com base no percentil do presente

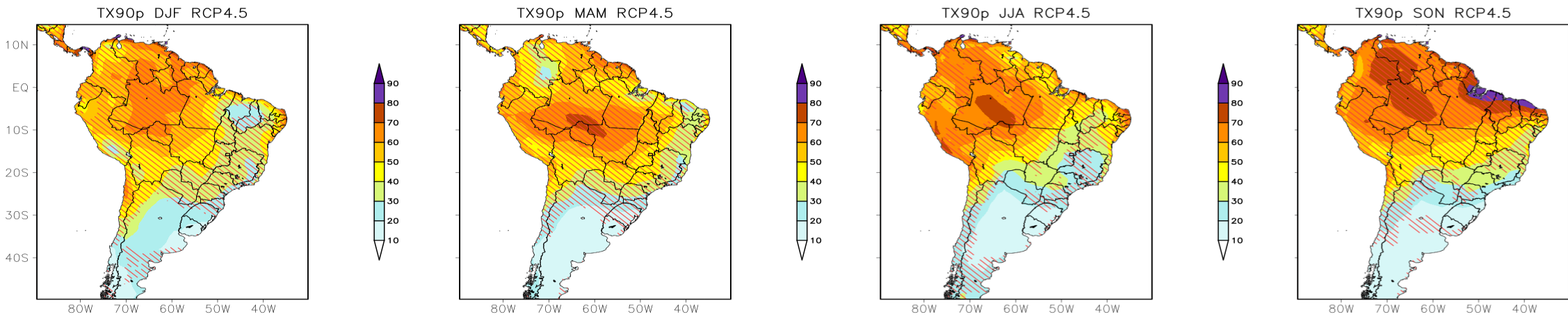
GCMs

ETA

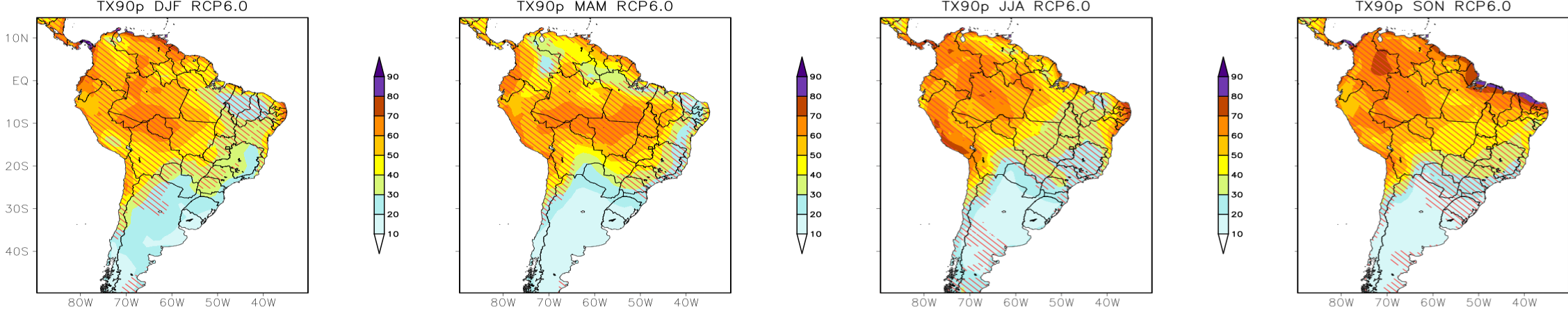
Historical



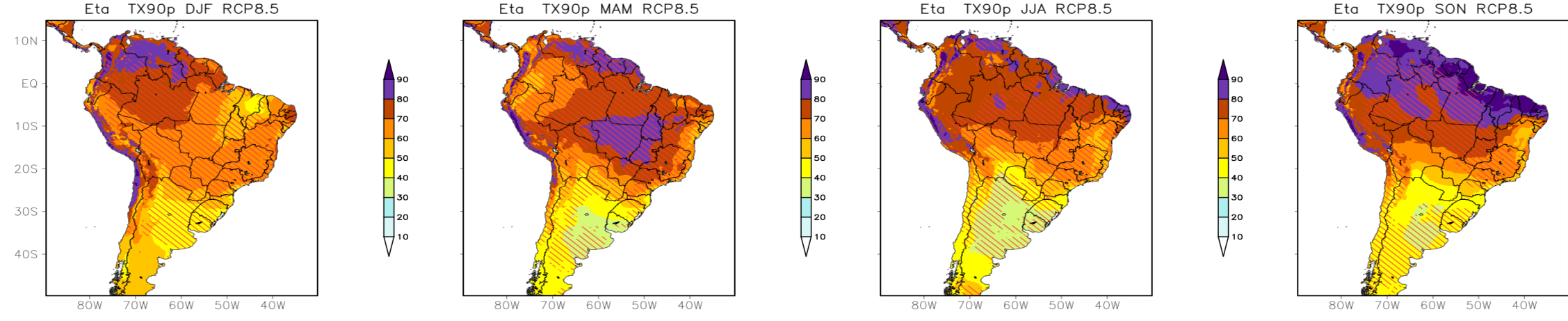
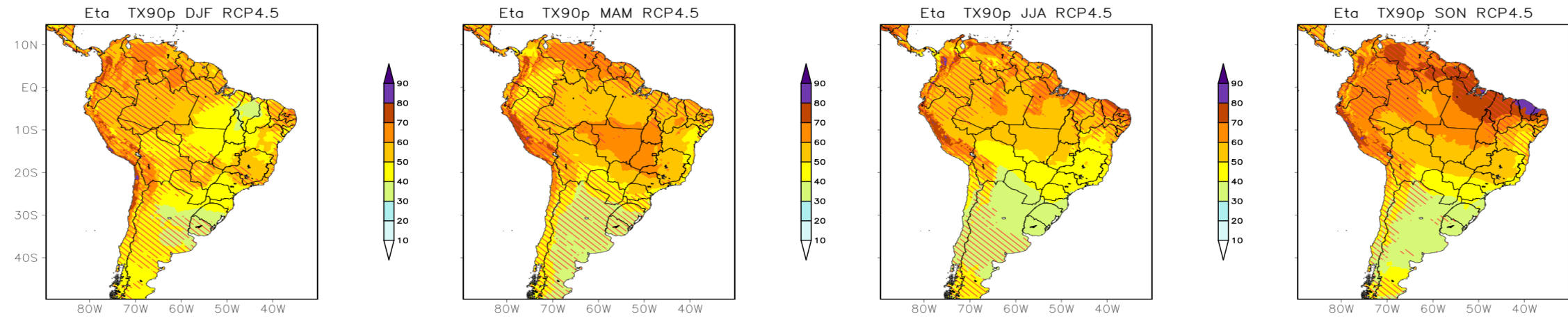
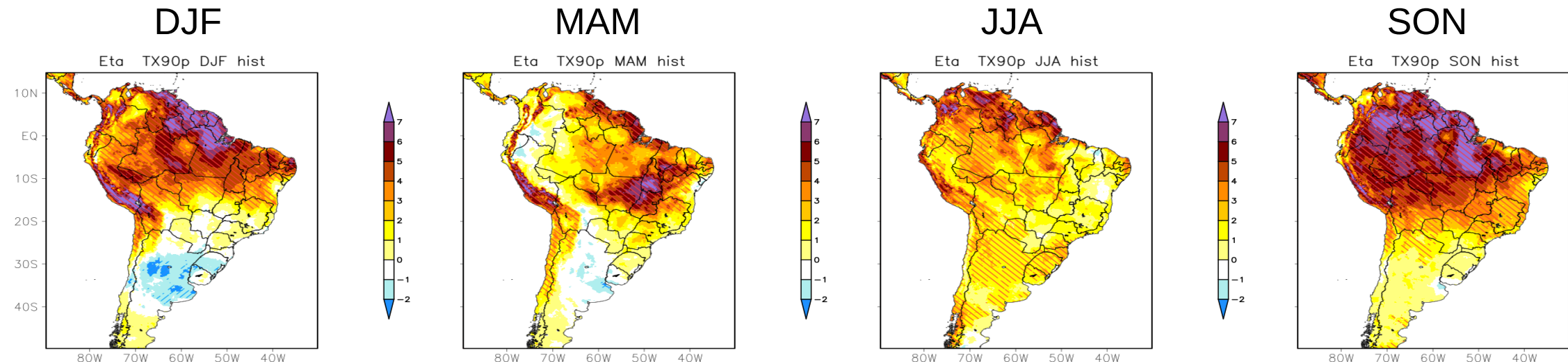
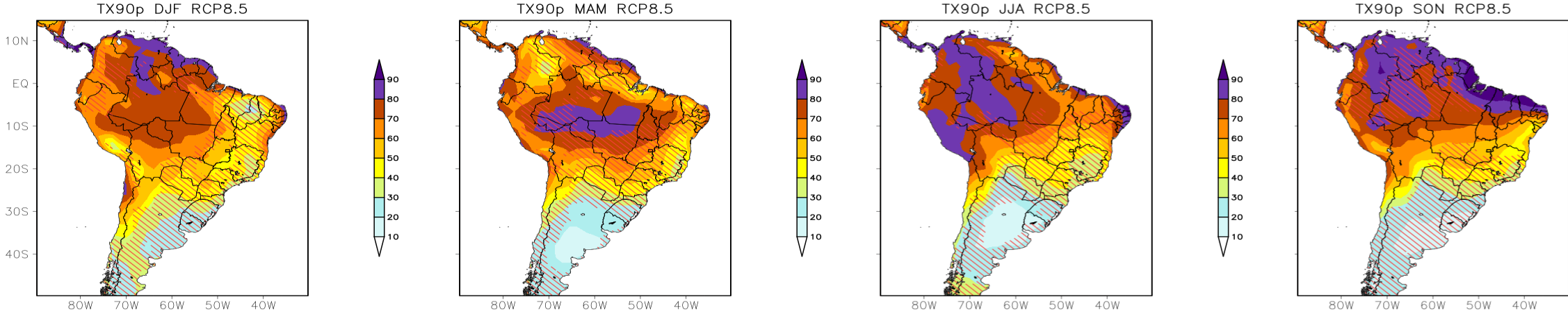
RCP4.5



RCP6.0



RCP8.5



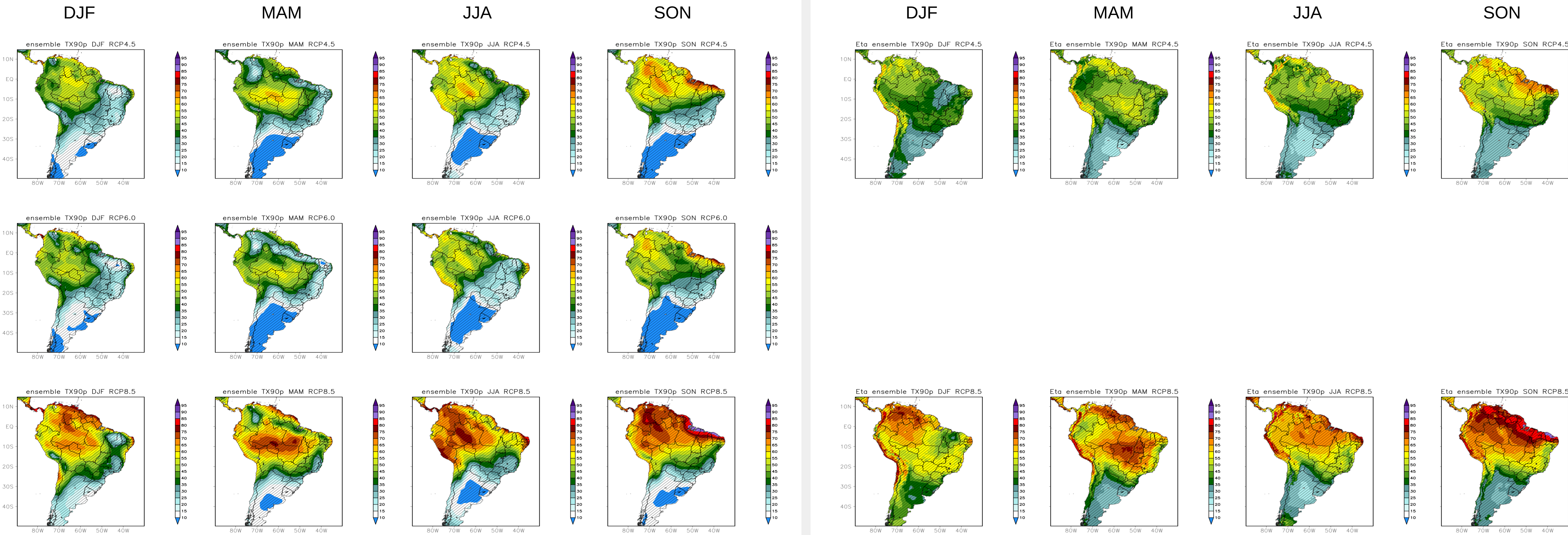
RCP4.5

RCP6.0

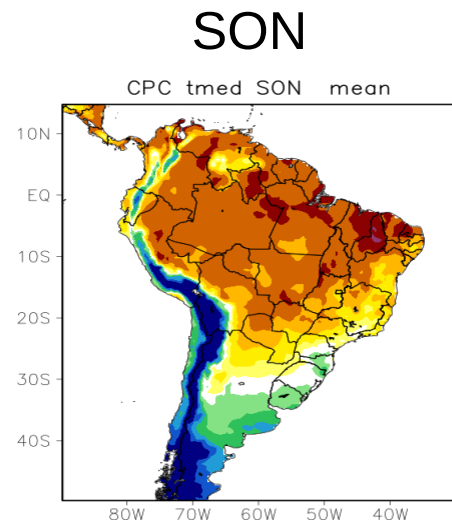
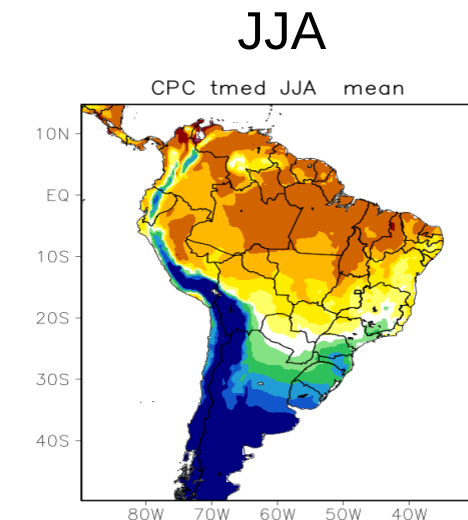
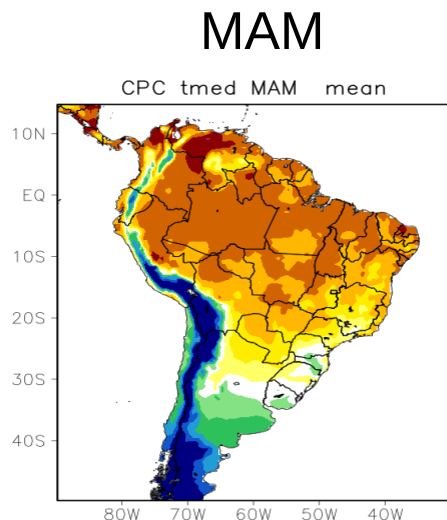
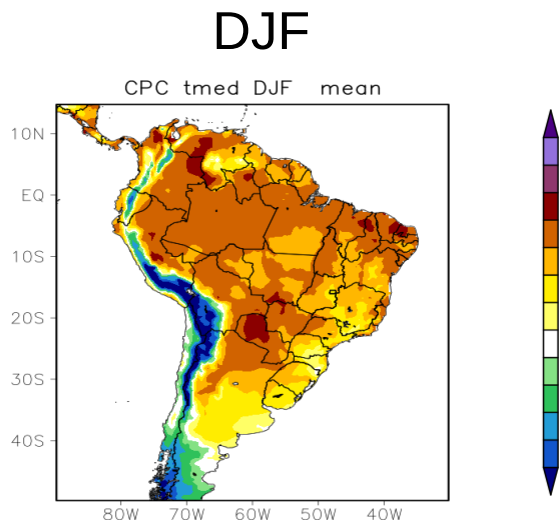
RCP8.5

GCMs

ETA



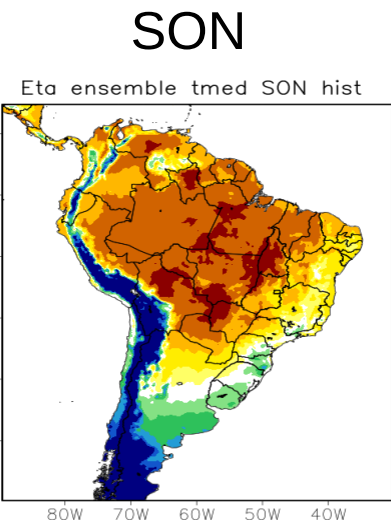
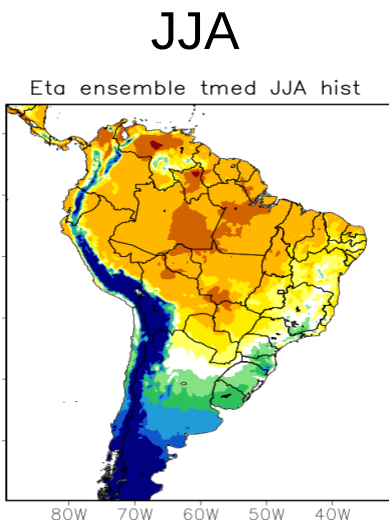
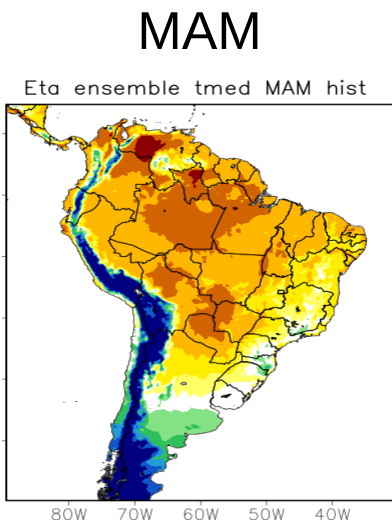
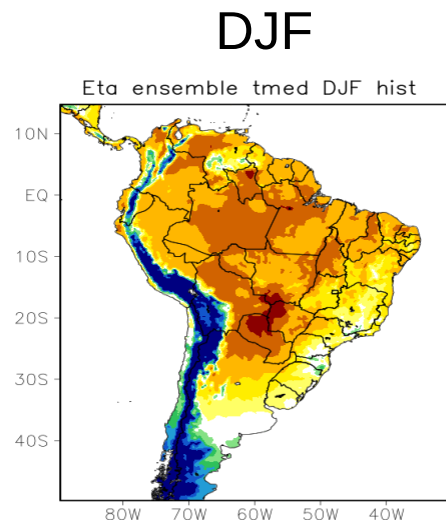
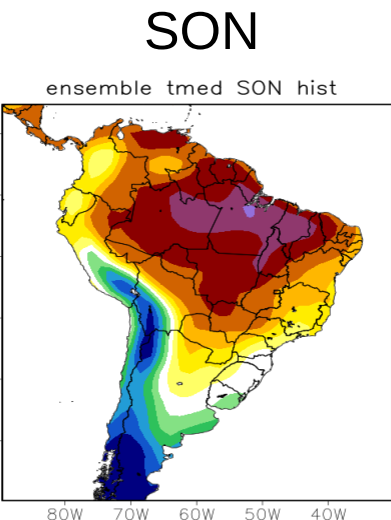
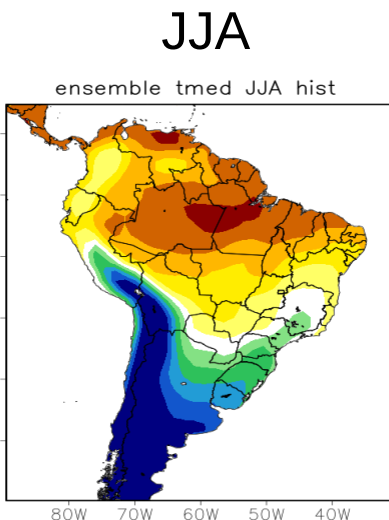
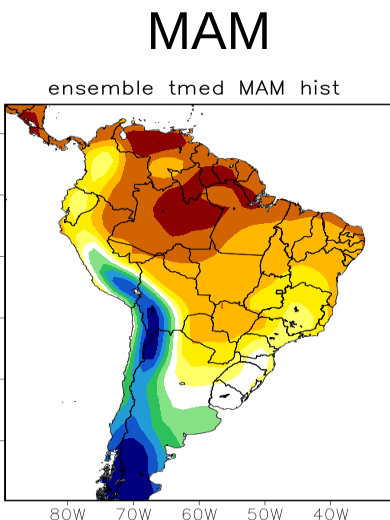
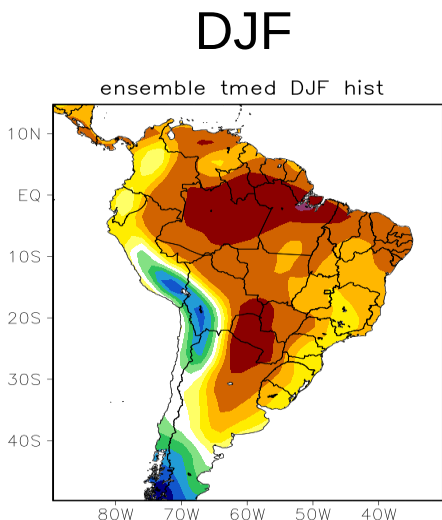
CPC



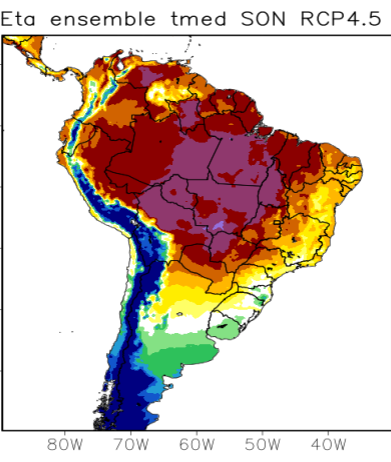
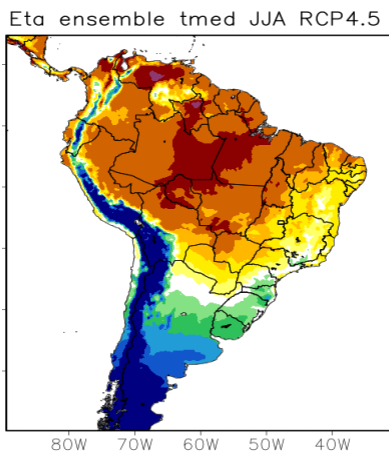
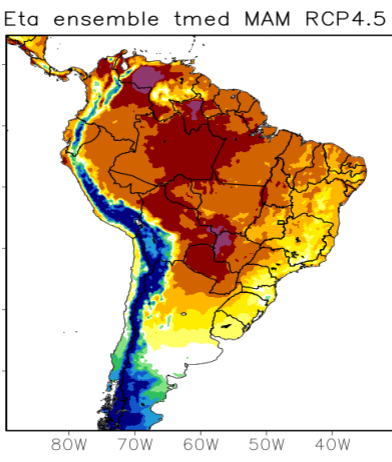
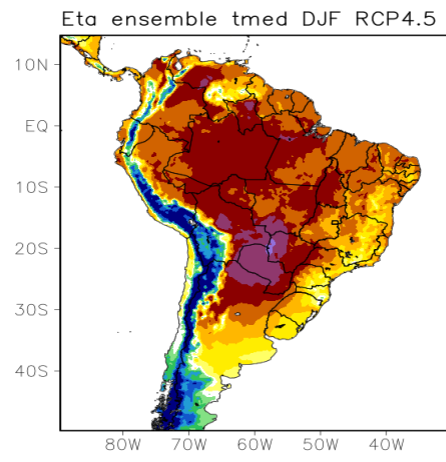
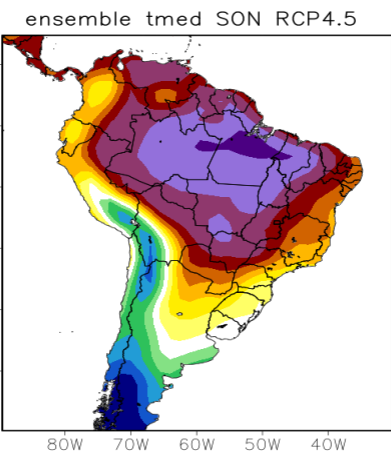
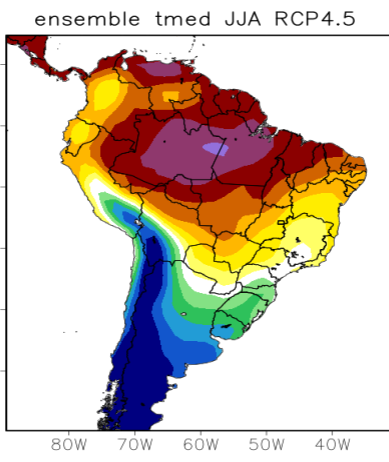
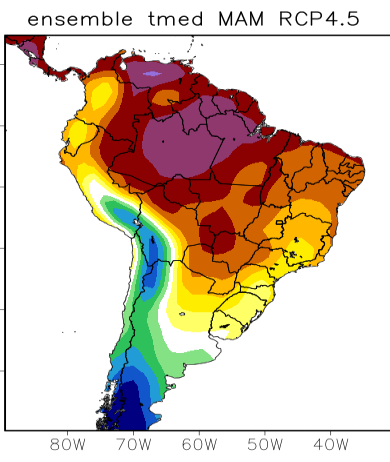
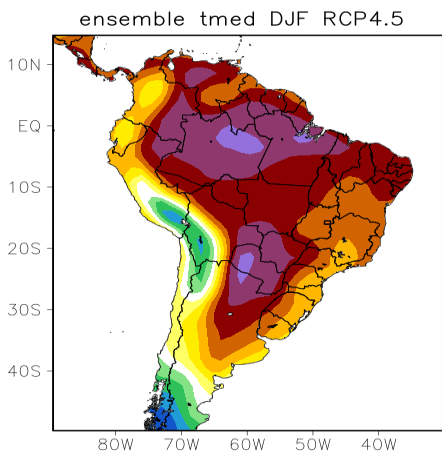
GCMs

ETA

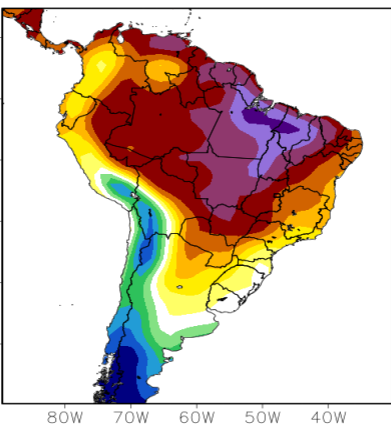
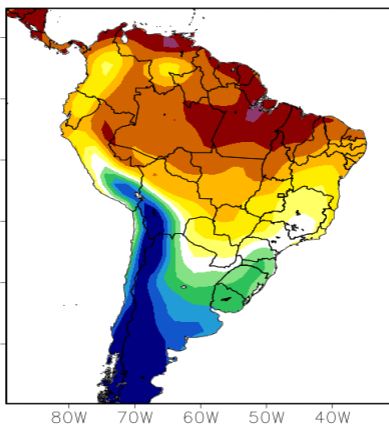
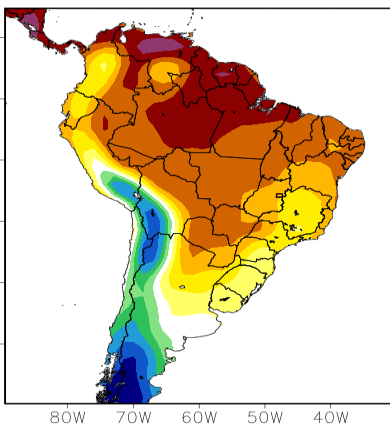
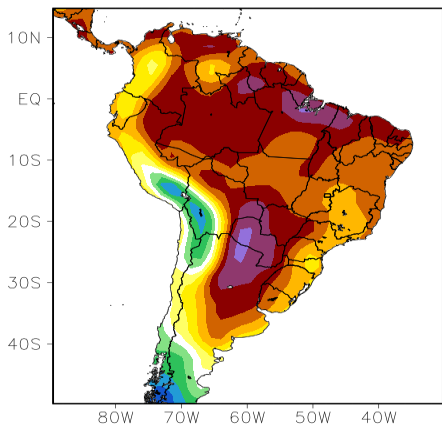
Historical



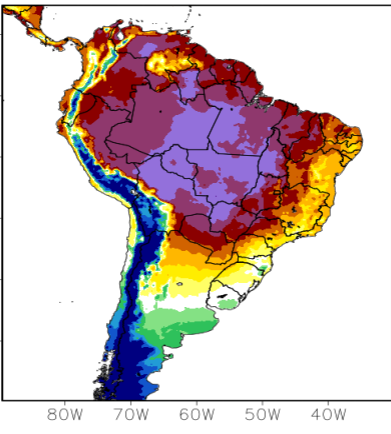
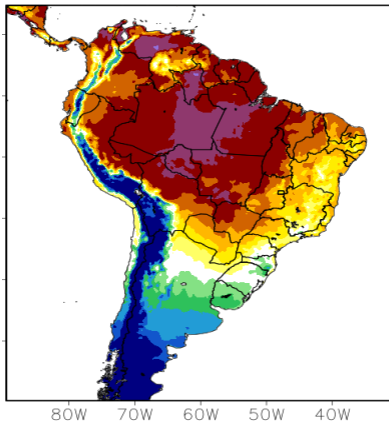
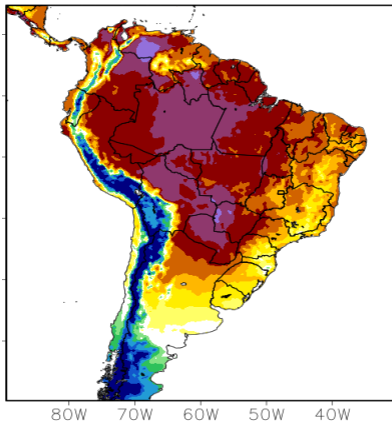
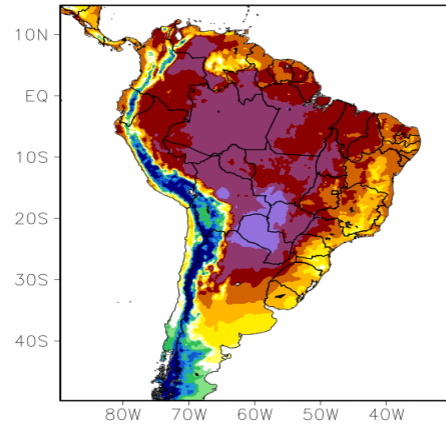
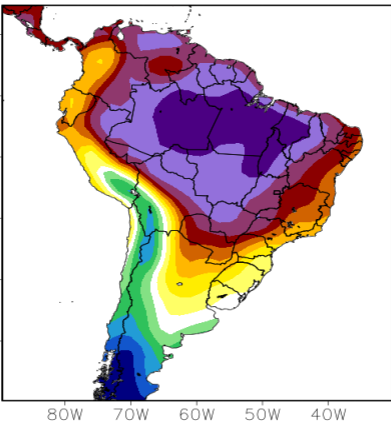
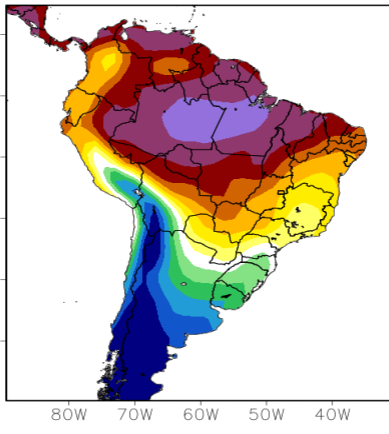
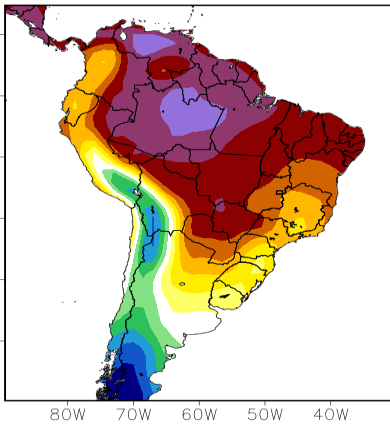
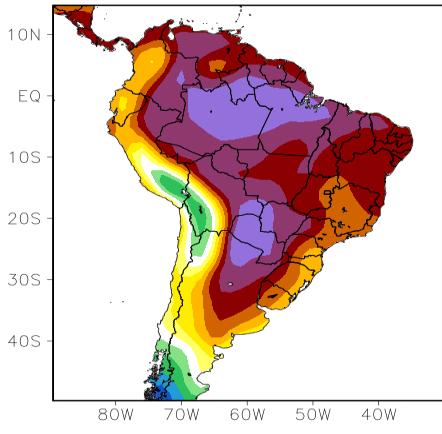
RCP4.5



RCP6.0



RCP8.5



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