

# Supporting Information for ”Long-term changes in global socioeconomic benefits of flood defenses and residual risk based on CMIP5 climate models”

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## References

IPCC (2012). Managing the risks of extreme events and disasters to advance climate change adaptation. In C.B., Field, V., Barros, T.F., Stocker, D., Qin, D.J., Dokken, K.L., Ebi, M.D., Mastrandrea, K.J., Mach, G.-K., Plattner, S.K., Allen, M., Tignor, P.M., Midgley (Eds.), *A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change*. Cambridge, UK and New York, NY, USA: Cambridge University Press.

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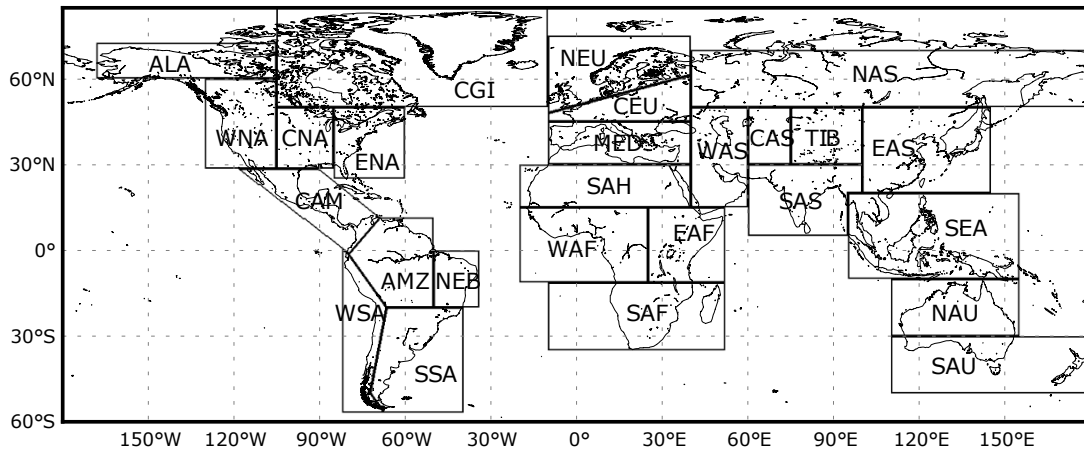
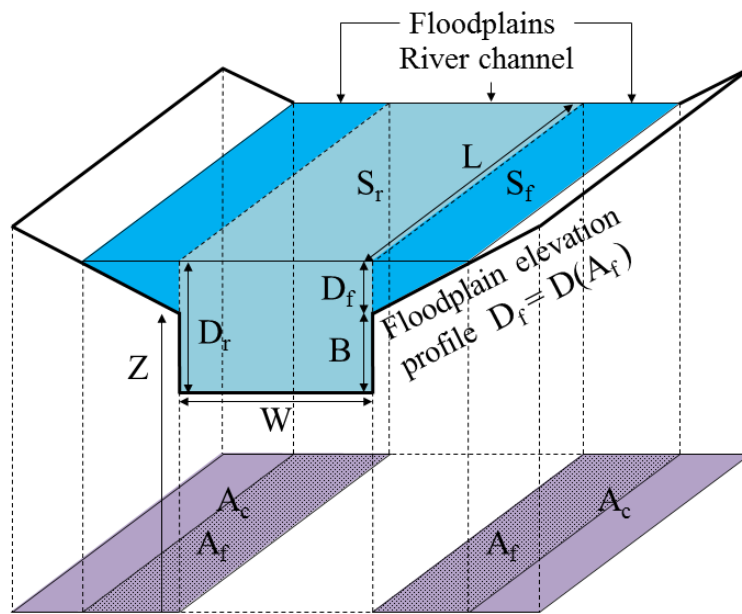
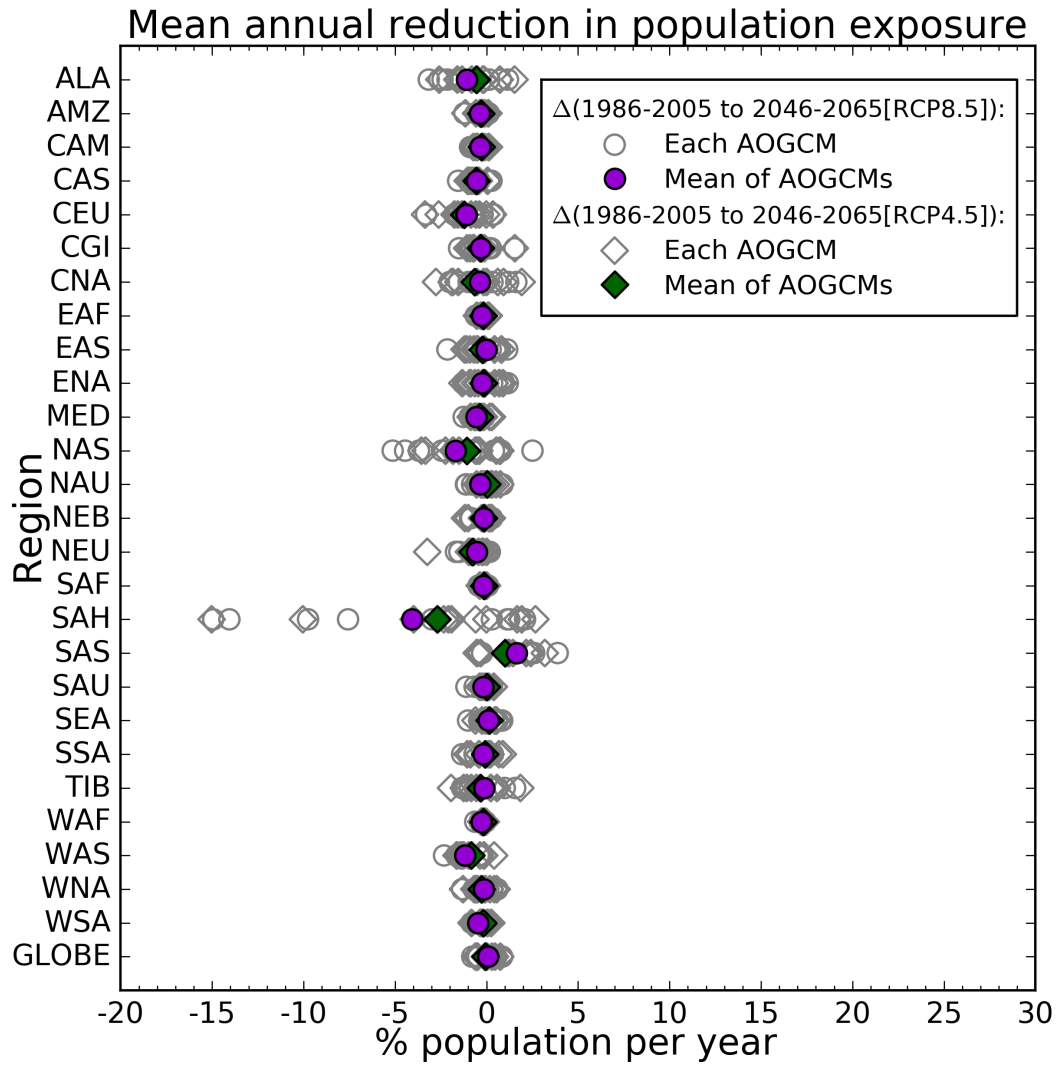


Figure S1. Definition of 26 sub-continental regions. After IPCC [2012, Table 3.A-1].

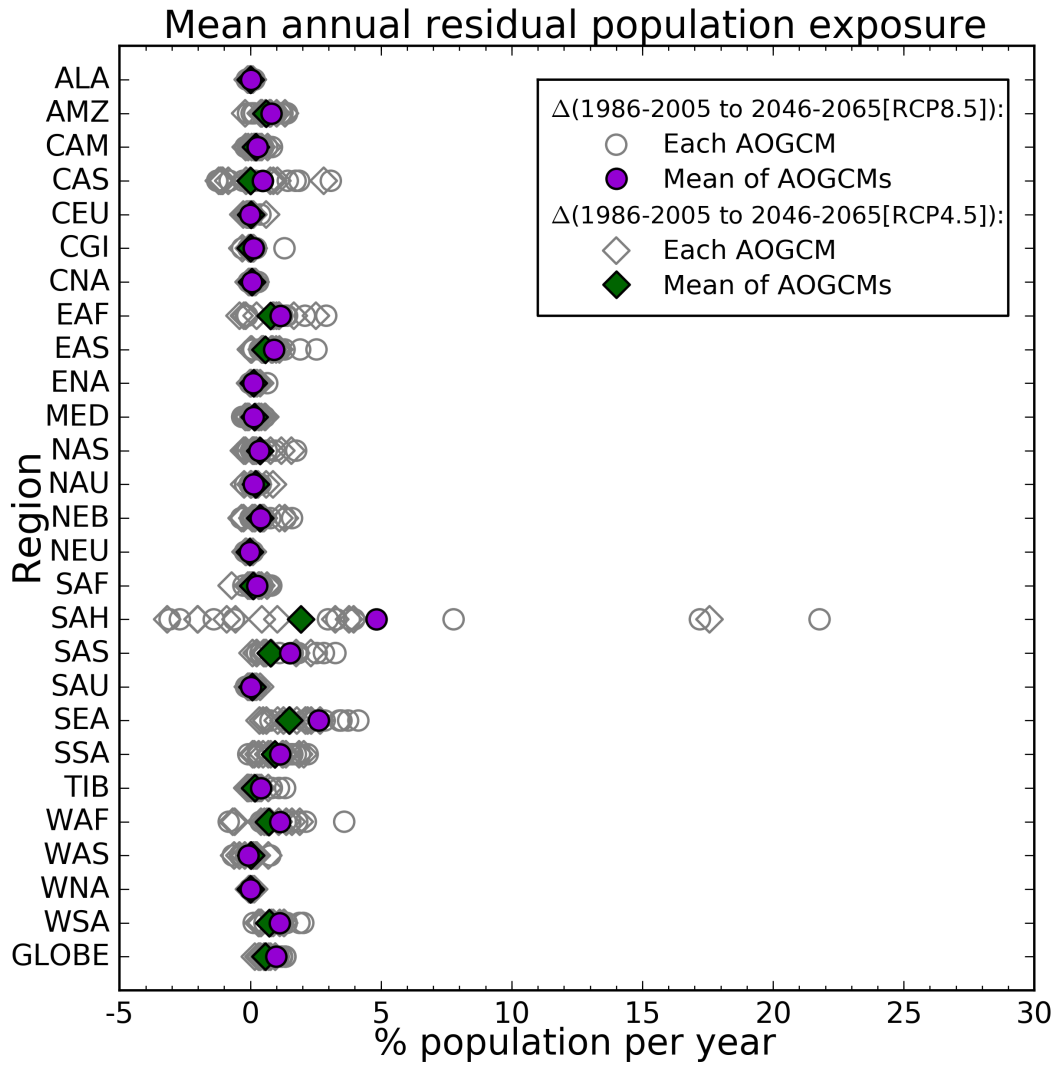


$D_r$  : river water depth;  $D_f$  : flood depth;  $B$  : channel depth;  
 $W$  : channel width;  $L$  : channel length;  $S_f$  : floodplain storage;  
 $S_r$  : river storage;  $A_c$  : unit-catchment area;  $A_f$  : flooded area;  
 $Z$  : base elevation.

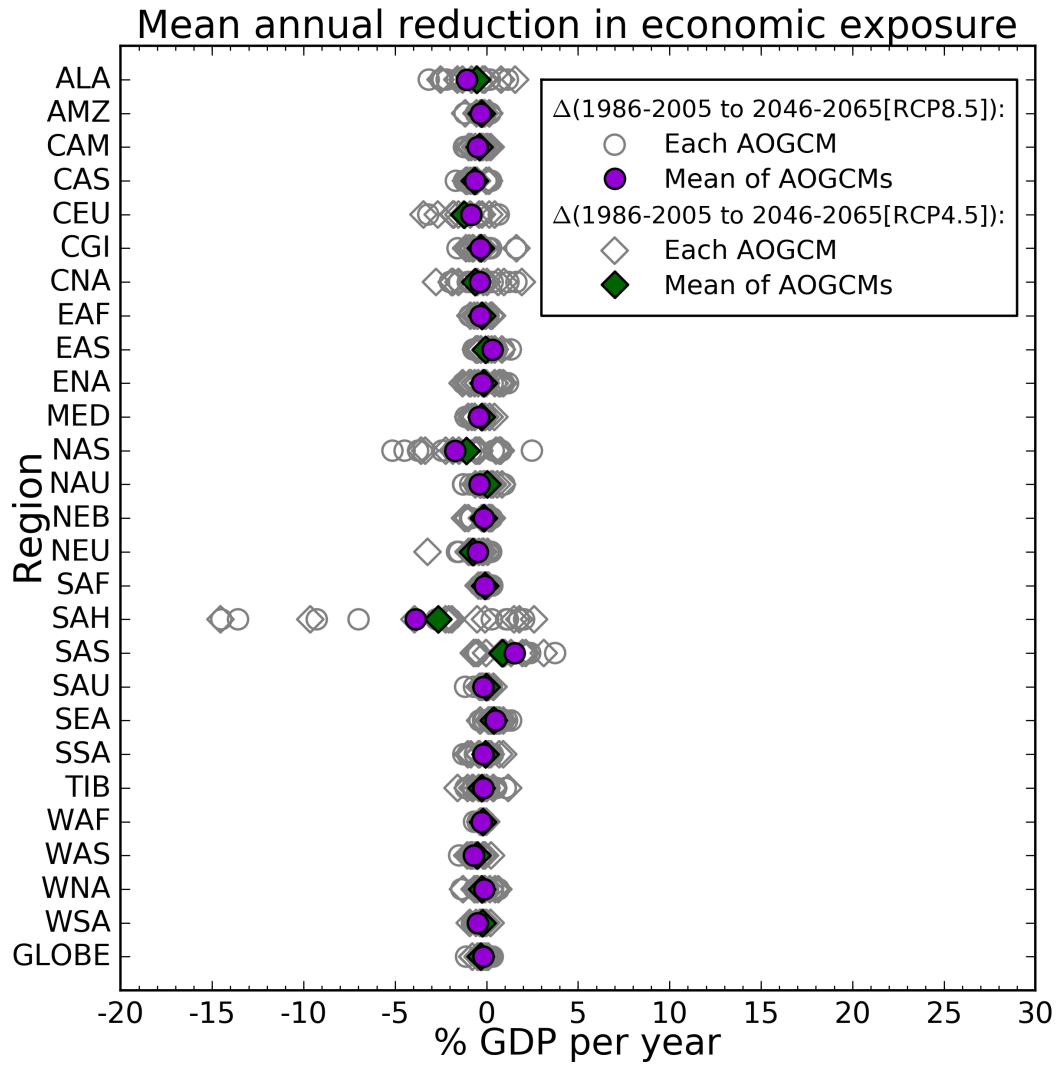
Figure S2. A schematic diagram of the river channel and floodplains for a grid cell (spatial resolution:  $0.25^\circ \times 0.25^\circ$ ) in CaMa-Flood model. After Yamazaki et al. [2011, Figure 1].



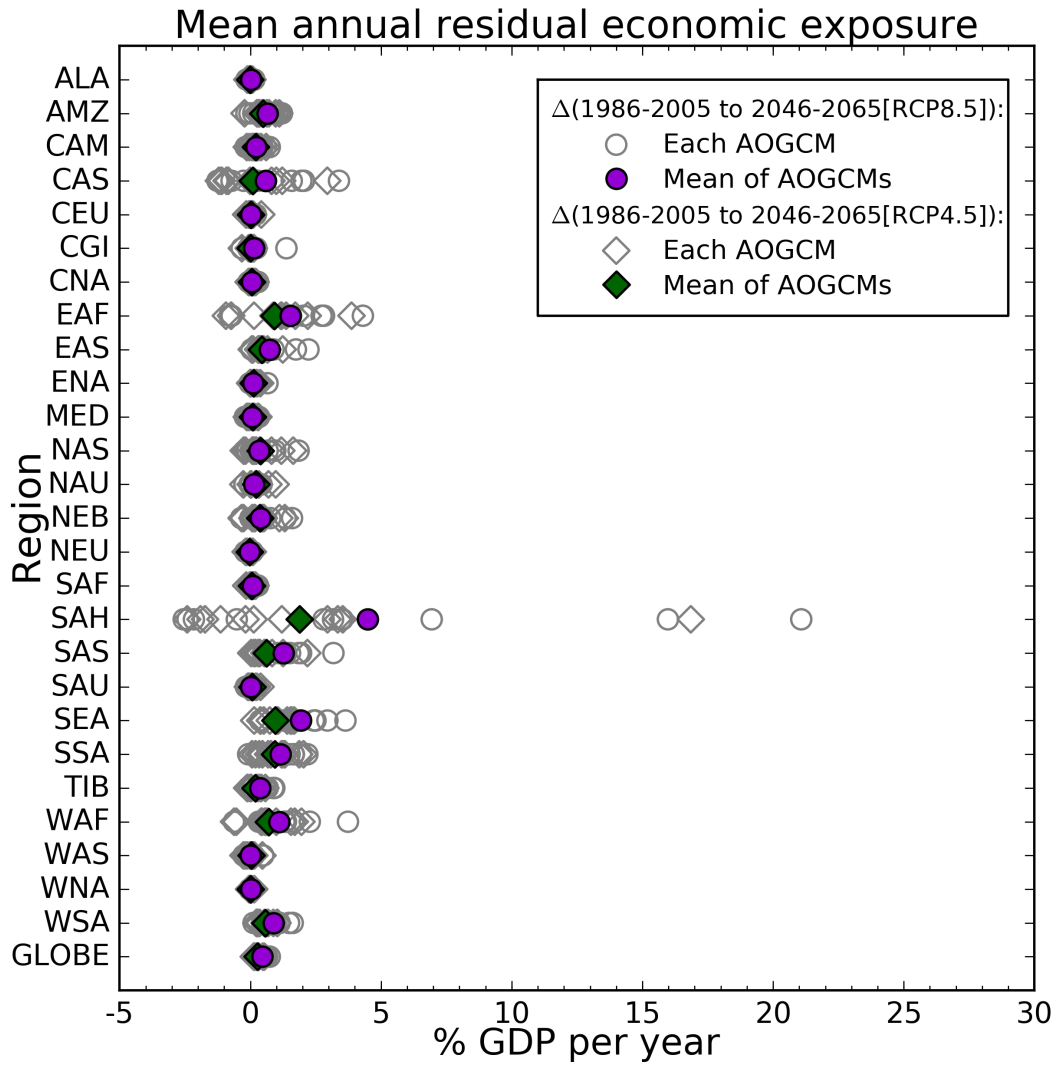
**Figure S3.** Reduction in population exposure at existing flood defense levels as a percentage of population per year in each region (Table 2) for  $\Delta(1986-2005 \text{ to } 2046-2065)$ .



**Figure S4.** Residual population exposure at existing flood defense levels as a percentage of population per year in each region (Table 2) for  $\Delta(1986-2005 \text{ to } 2046-2065)$ .

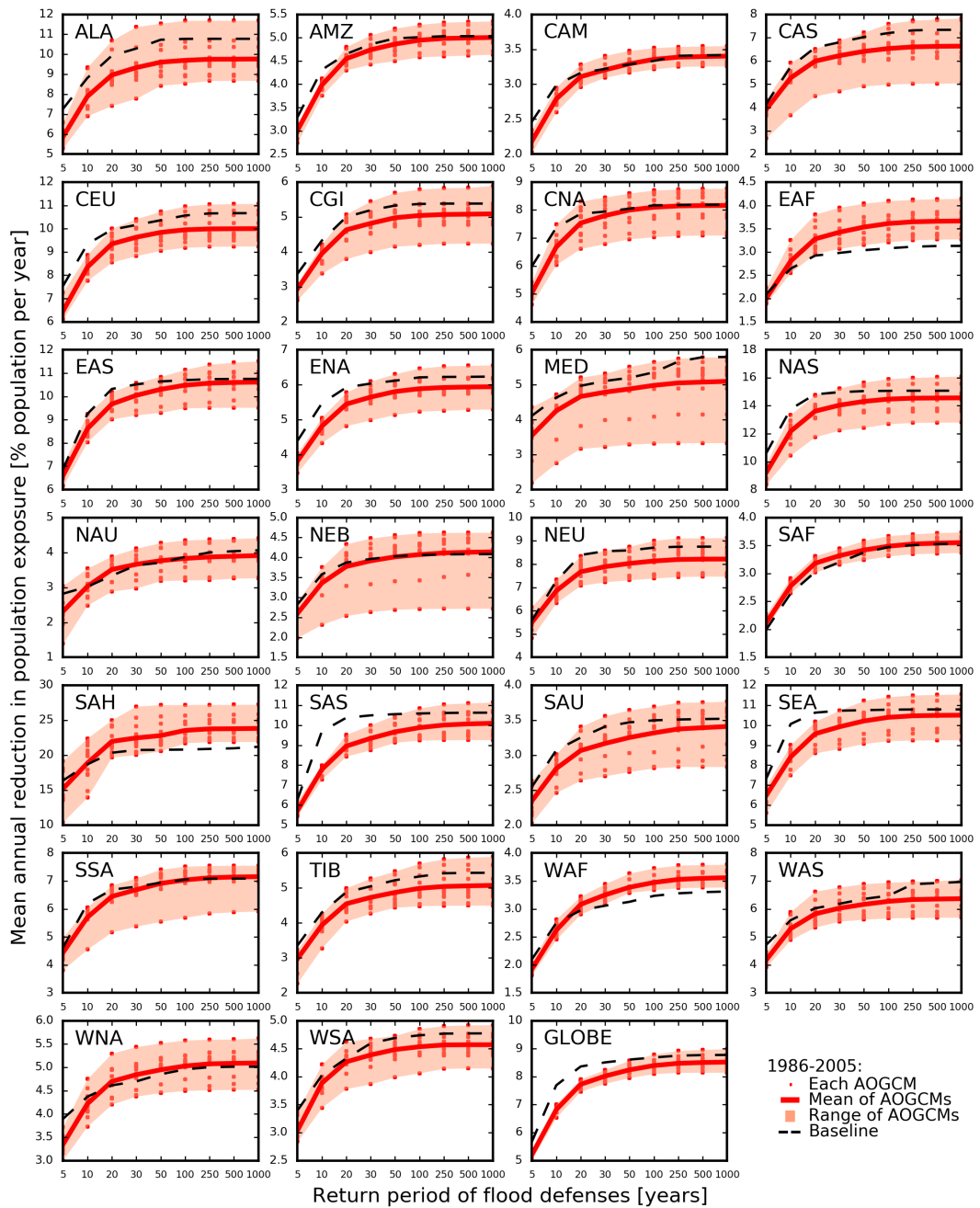


**Figure S5.** Reduction in economic exposure at existing flood defense levels as a percentage of GDP per year in each region (Table 2) for  $\Delta(1986-2005 \text{ to } 2046-2065)$ .

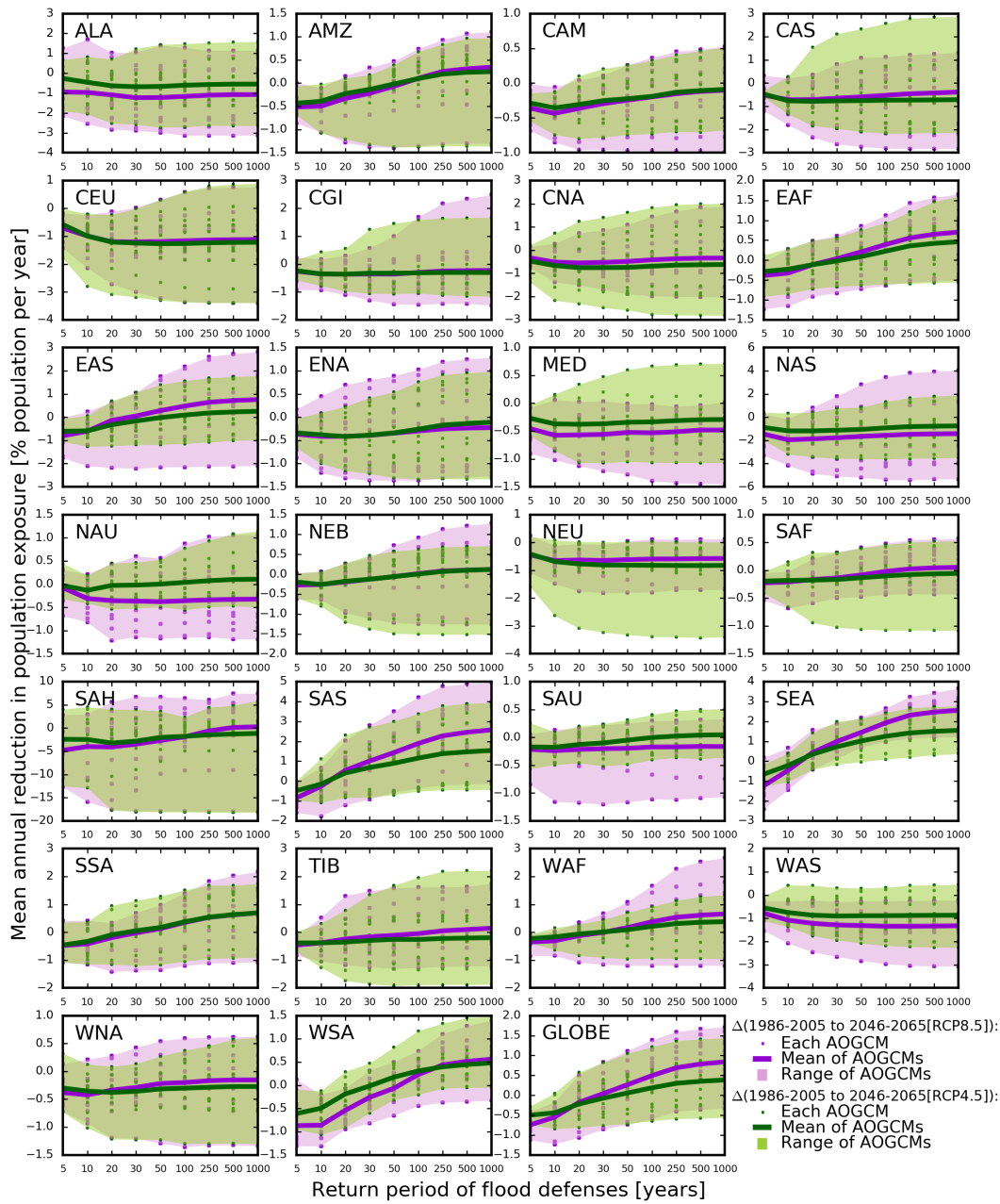


**Figure S6.** Residual economic exposure at existing flood defense levels as a percentage of GDP per year in each region (Table 2) for  $\Delta(1986-2005 \text{ to } 2046-2065)$ .

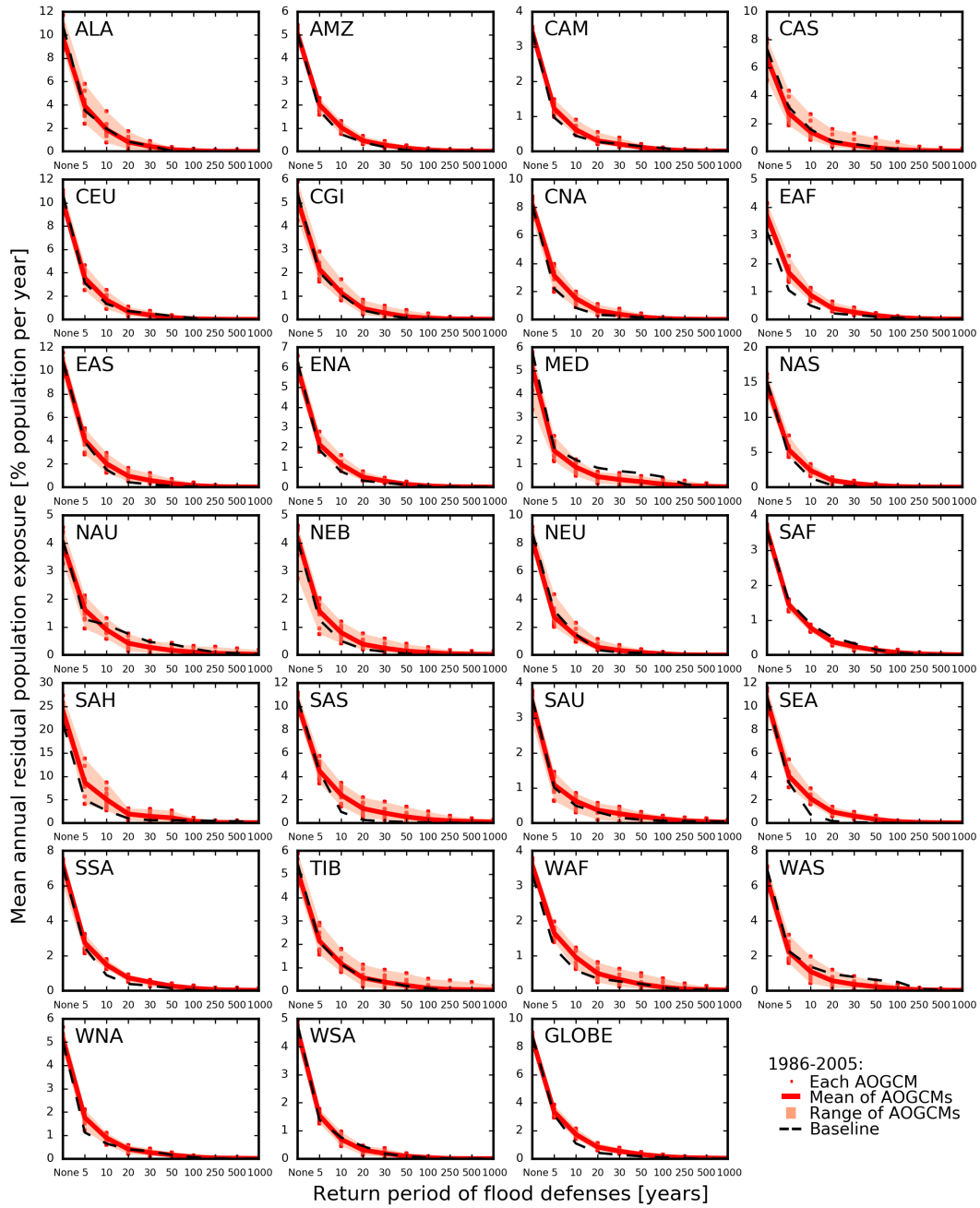




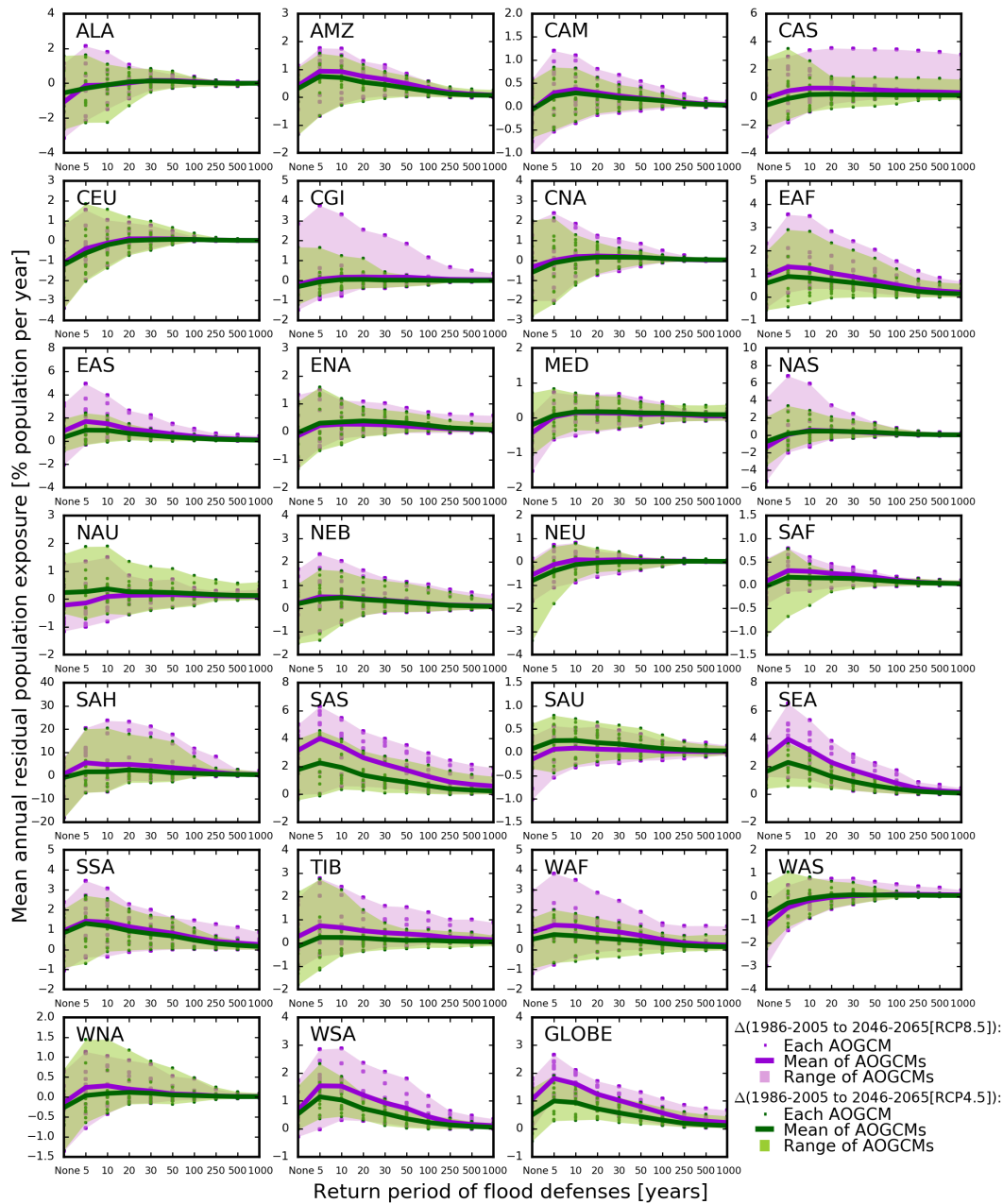
**Figure S7.** Reduction in population exposure versus flood defense level (expressed in return period) as a percentage of population per year in each region (Table 2) for 1986-2005.



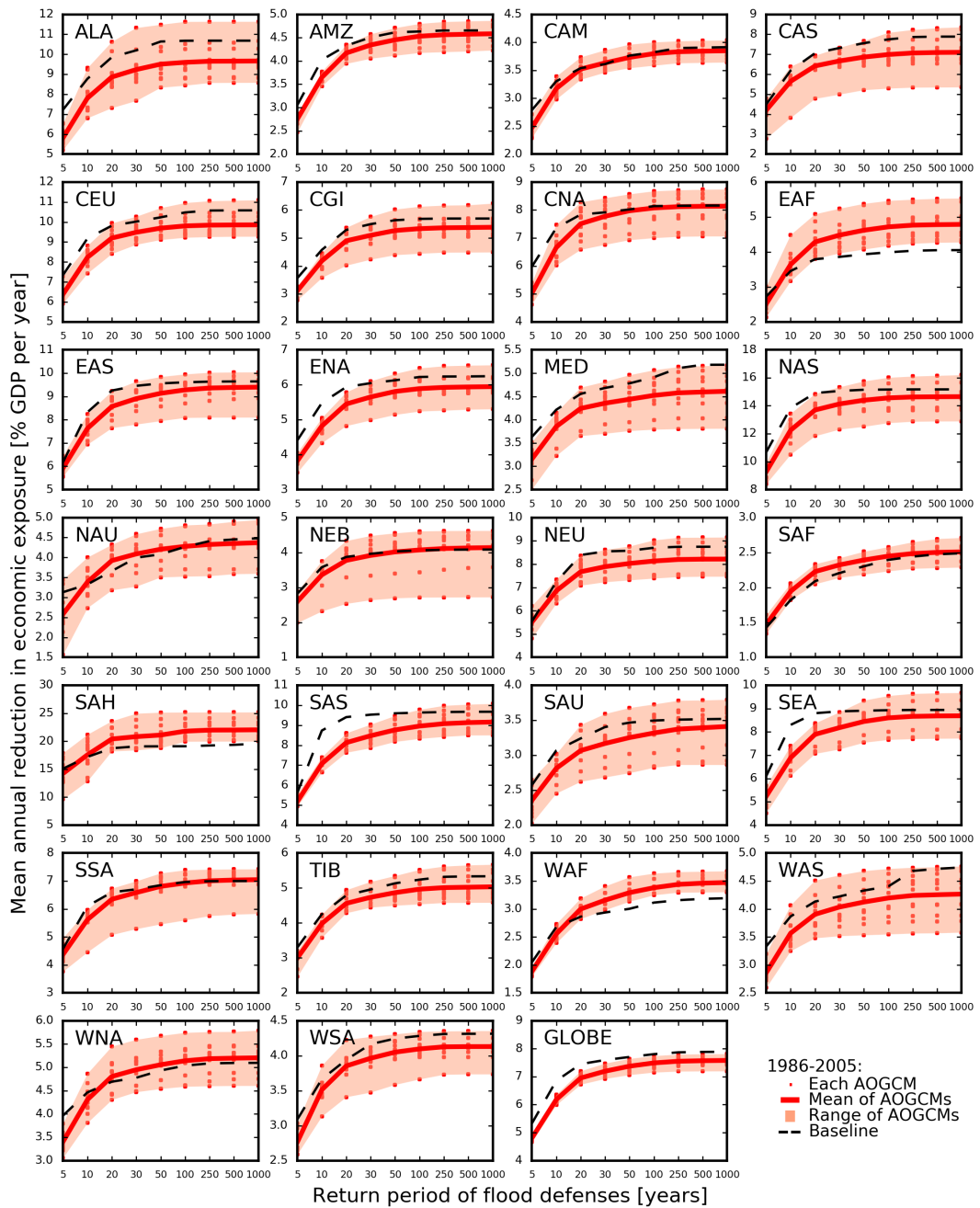
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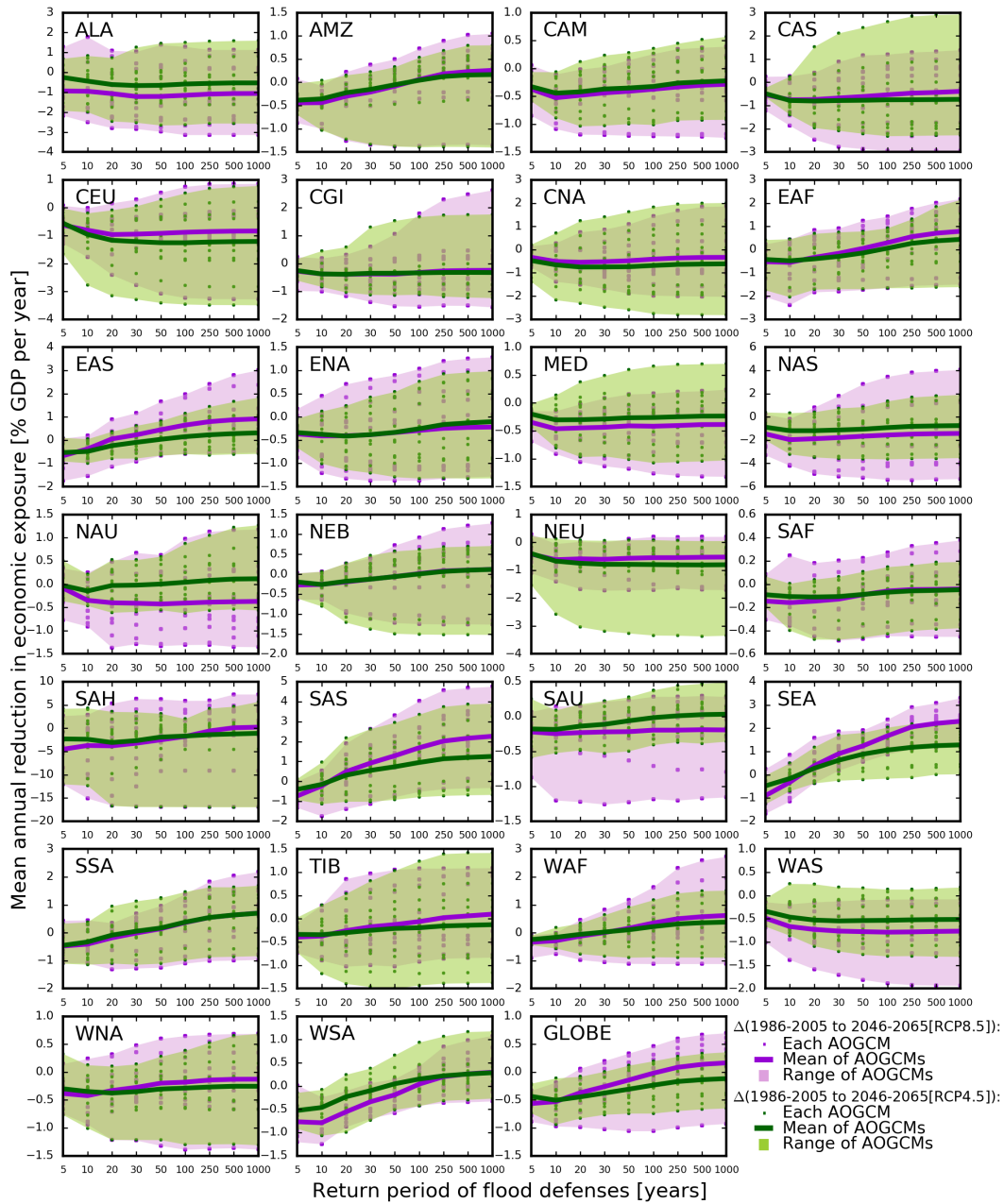
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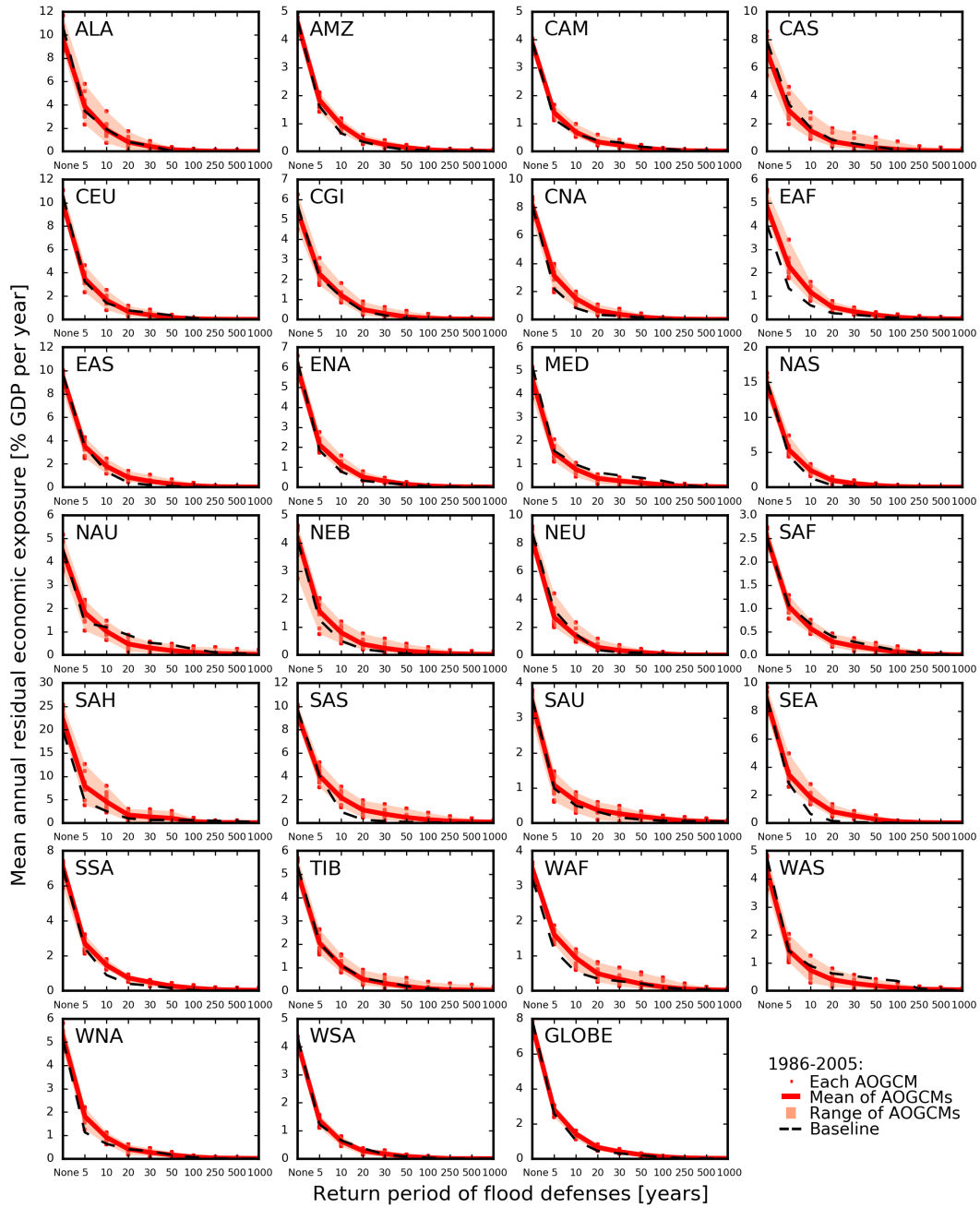
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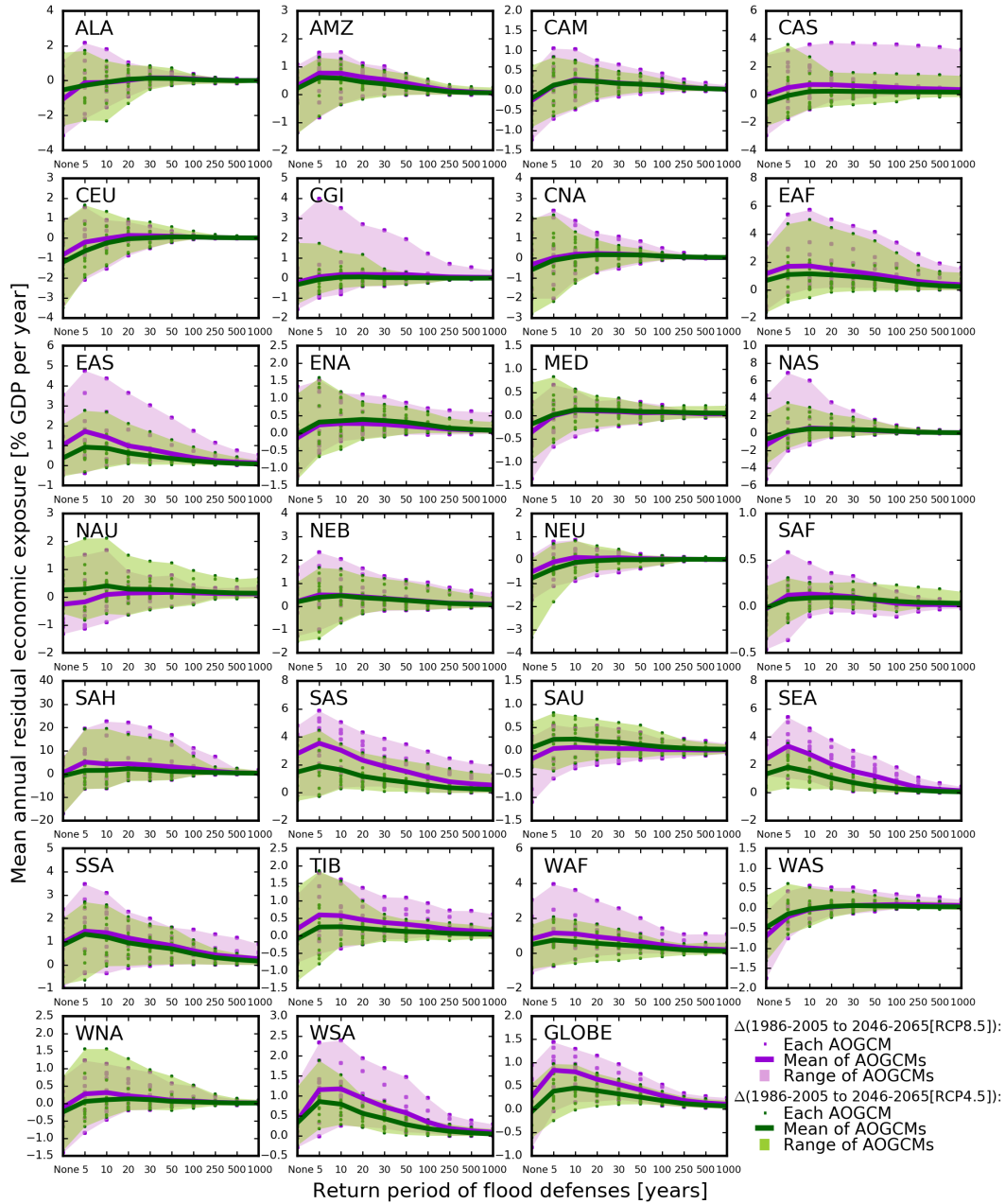
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