

In the format provided by the authors and unedited.

Global economic response to river floods

Sven Norman Willner ^{1,2}, Christian Otto ^{1,3} and Anders Levermann ^{1,2,3*}

¹Potsdam Institute for Climate Impact Research, Potsdam, Germany. ²Institute of Physics, Potsdam University, Potsdam, Germany. ³Columbia University, LDEO, Palisades, NY, USA. *e-mail: anders.levermann@pik-potsdam.de

Table of contents

Supplementary Figure 1: Change in global annual mean surface air temperature relative to the average of 1986–2005.

Supplementary Figure 2: Increase in economic losses due to fluvial floods in economically strong and populated areas (ensemble details)

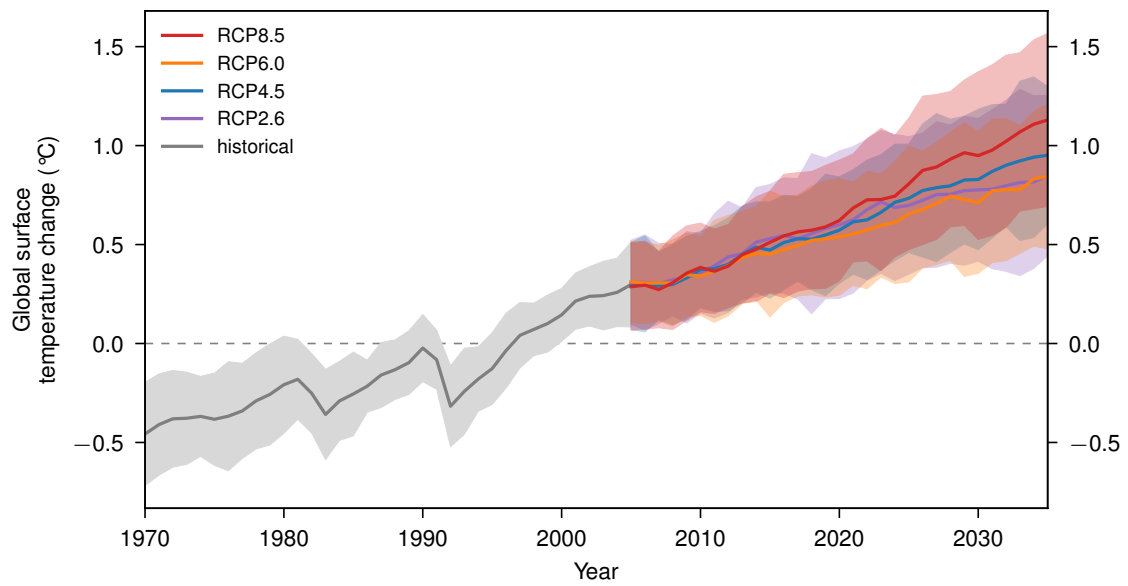
Supplementary Figure 3: Losses propagated through trade relations for key regions (ensemble details)

Supplementary Figure 4: Export-Import relations between the three key regions

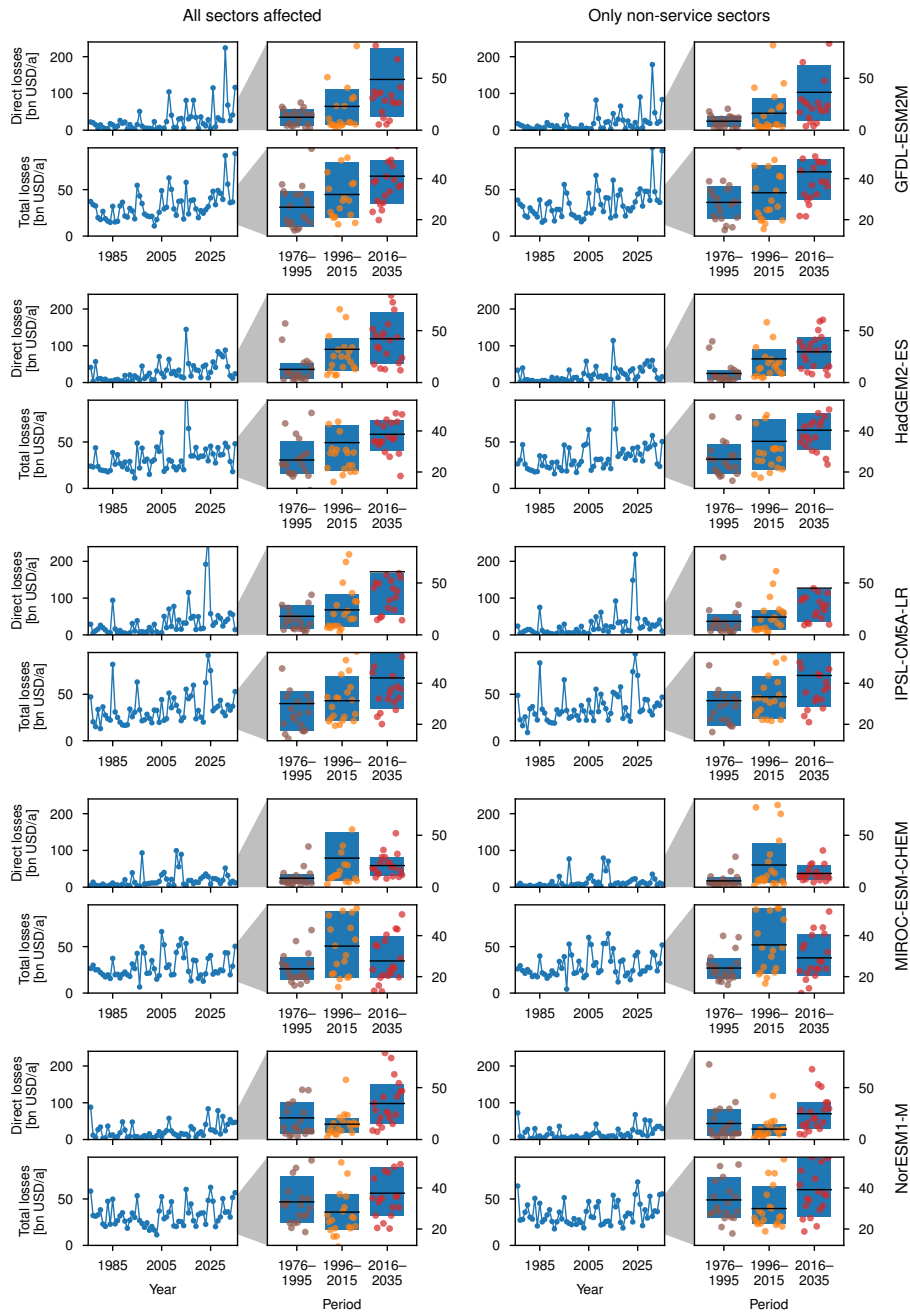
Supplementary Figure 5: Direct and total losses for the three periods in the study

Supplementary Table 1: Sectors used in the numerical simulations

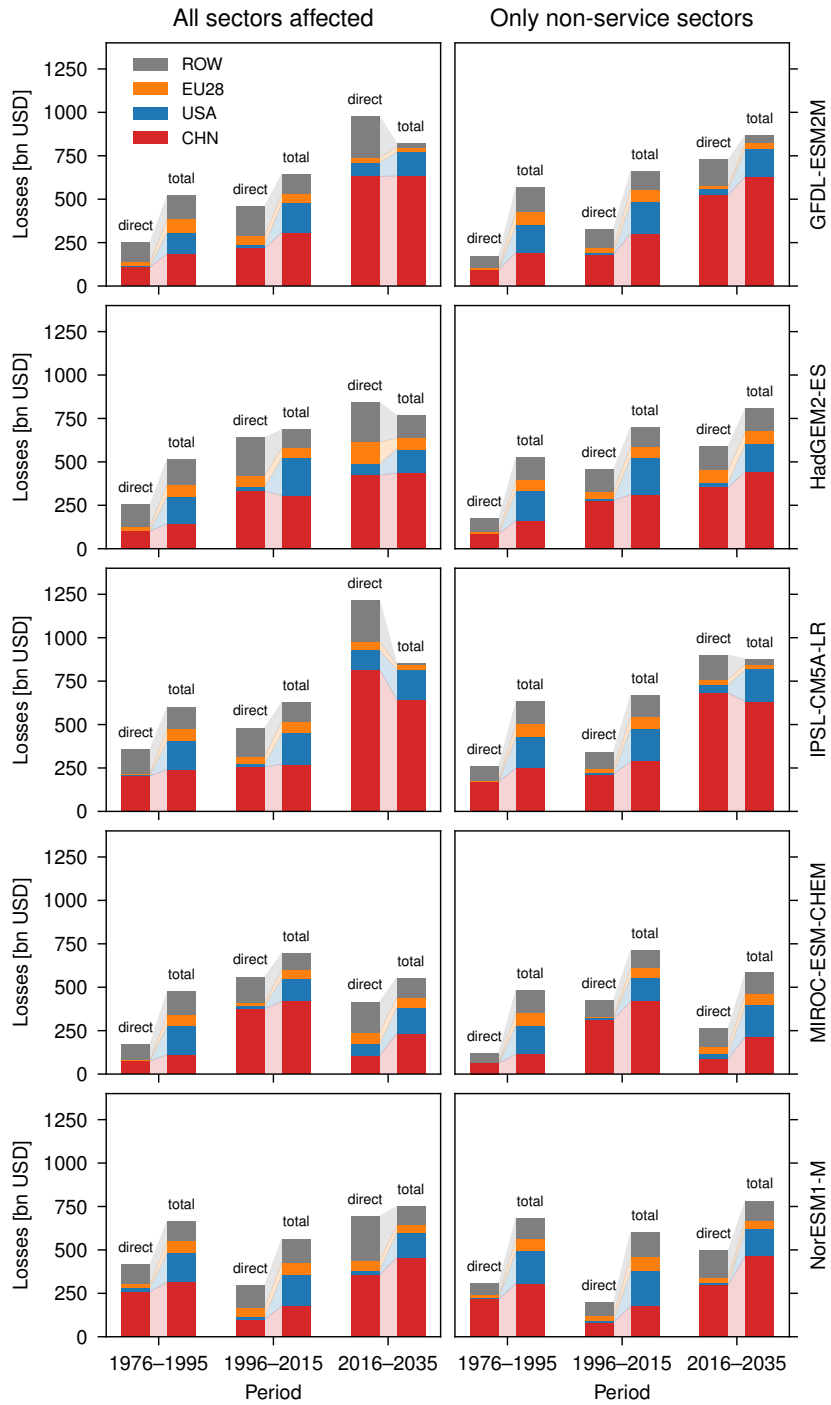
Supplementary Video S1: Video of the regional distribution of direct and total losses on a monthly basis.



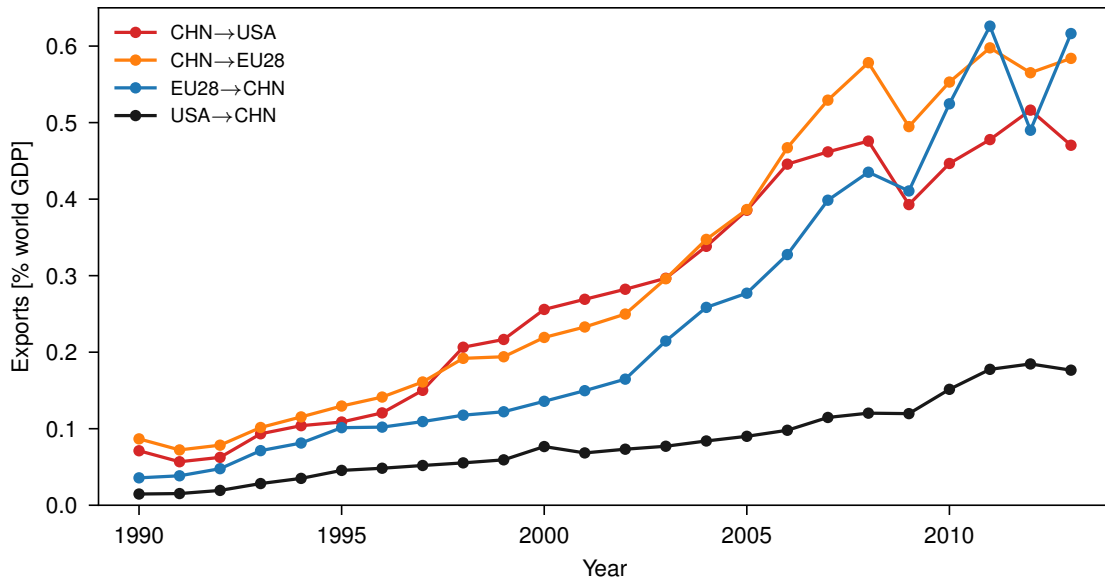
Supplementary Figure 1: Change in global annual mean surface air temperature relative to the average of 1986–2005. Solid lines represent the average of the model ensemble and shadings show the 1.64 standard deviation range around the average (5% to 95% when assuming normal distributions). Projections (after 2004) are shown for the four standard Representative Concentration Pathways (*RCPs*). After Fig. 12.5 of the IPCC AR5WG1.



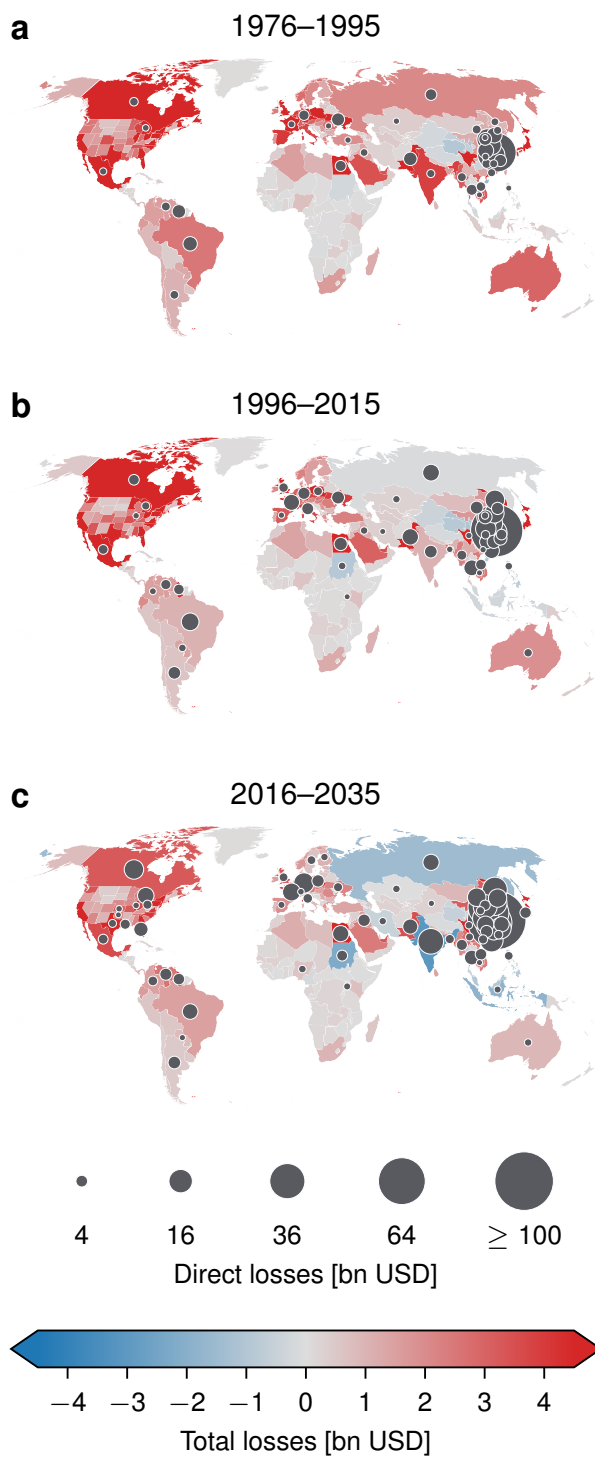
Supplementary Figure 2: Increase in economic losses due to fluvial floods in economically strong and populated areas (ensemble details). Figures as in Fig. 1 for each model in the ensemble (rows) and for all sectors directly affected by flooding (left column) versus only non-service sectors (right column) as given in [Supplementary Table 1](#).



Supplementary Figure 3: Losses propagated through trade relations for key regions (ensemble details). Figures as in Fig. 3b for each model in the ensemble (rows) and for all sectors directly affected by flooding (left column) versus only non-service sectors (right column) as given in [Supplementary Table 1](#).



Supplementary Figure 4: Export-Import relations between the three key regions. Numbers are given in percent of world GDP (for the corresponding year). The export from the United States of America (USA) to China (CHN) has not increased like the other trade relations yielding an imbalance in trade between China and the USA. EU28 denotes the European Union.



Supplementary Figure 5: Direct and total losses for the three periods in the study. The total sums of direct losses are given as circles for each particular region, those of total losses as colours (red for net losses, blue for net gains) for the periods 1976–1995 (**a**), 1996–2015 (**b**), and 2016–2035 (**c**). An animation of the entire time series for the full period is provided as Supplementary Video S1. Values are for the model ensemble mean.

Supplementary Table 1: Sectors used in the numerical simulations.

Code	Name	Directly affected?
AGRI	Agriculture	affected
FISH	Fishing	affected
MINQ	Mining and Quarrying	affected
FOOD	Food & Beverages	affected
TEXL	Textiles and Wearing Apparel	affected
WOOD	Wood and Paper	affected
OILC	Petroleum, Chemical and Non-Metallic Mineral Products	affected
METL	Metal Products	affected
MACH	Electrical and Machinery	affected
TREQ	Transport Equipment	affected
MANU	Other Manufacturing	affected
ELWA	Electricity, Gas and Water	affected
CONS	Construction	affected
REPA	Maintenance and Repair	affected
WHOT	Wholesale Trade	affected
RETT	Retail Trade	affected
TRAN	Transport	affected
RECY	Recycling	not affected
GAST	Hotels and Restaurants	not affected
COMM	Post and Telecommunications	not affected
FINC	Financial Intermediation and Business Activities	not affected
ADMI	Public Administration	not affected
EDHE	Education, Health and Other Services	not affected
HOUS	Private Households	not affected
OTHE	Others	not affected
REXI	Re-export & Re-import	not affected

Supplementary Video S1: Online, we provide a video showing the regional distribution of direct and total losses per day for the whole time series (1976–2035) on a monthly basis for the model combination of *GFDL-ESM2M* and *LPJmL*. The style follows that of [Supplementary Fig. 5](#).