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ICFM Webinar

"Doubled crises - Flooding in a time of pandemic"

Thursday, May 28th 2020

Flood-risk projections in a multi-risk context

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- **Floods under Covid**
- **Climate variability track**
- **Projections for the future**

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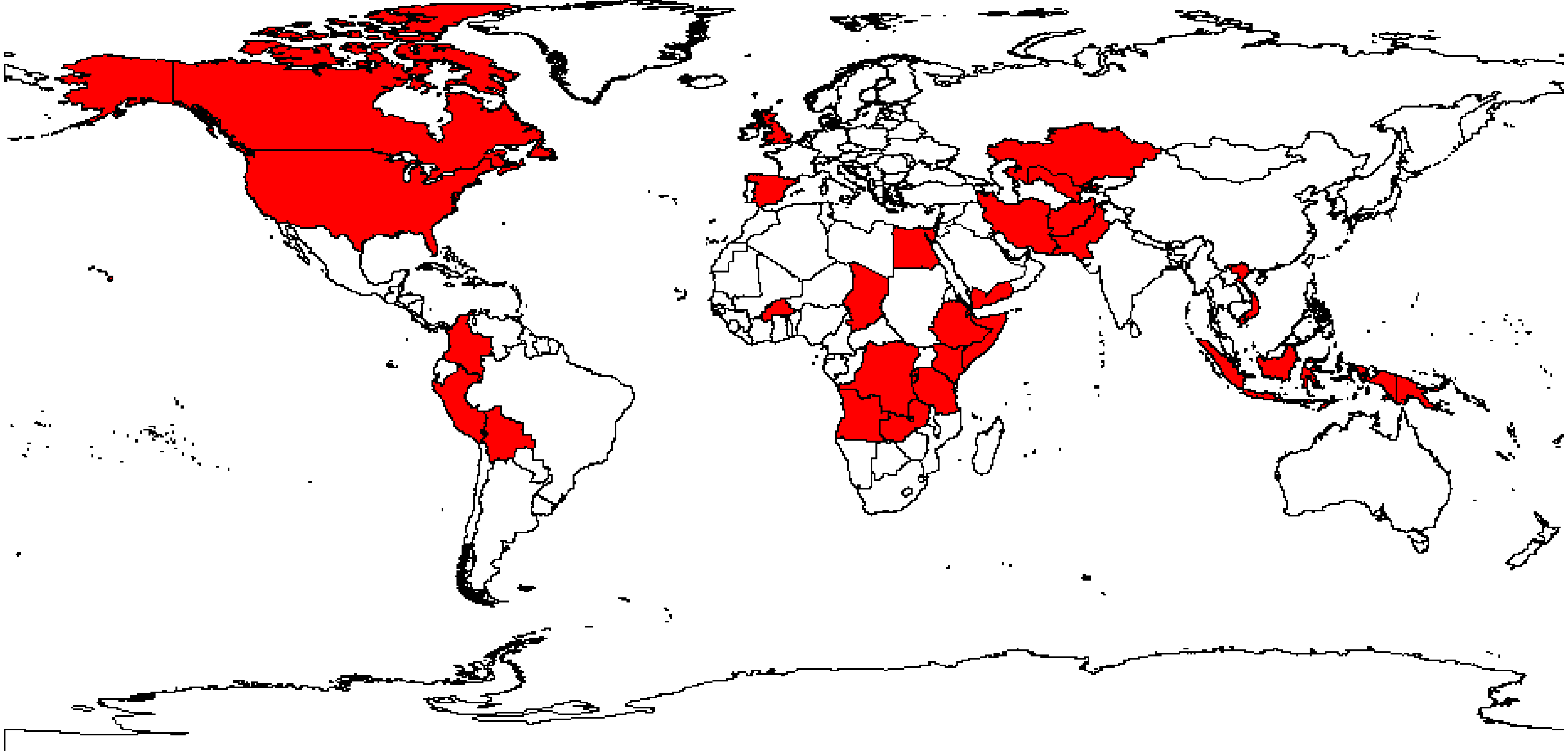


There have been 30 countries with flood events occurring after detection of the first Covid case. The numbers of displaced population because of floods were: 101 thousand in Uzbekistan and Kazakhstan, 81 thousand in Somalia and Ethiopia, and 78 thousand in DR Congo.

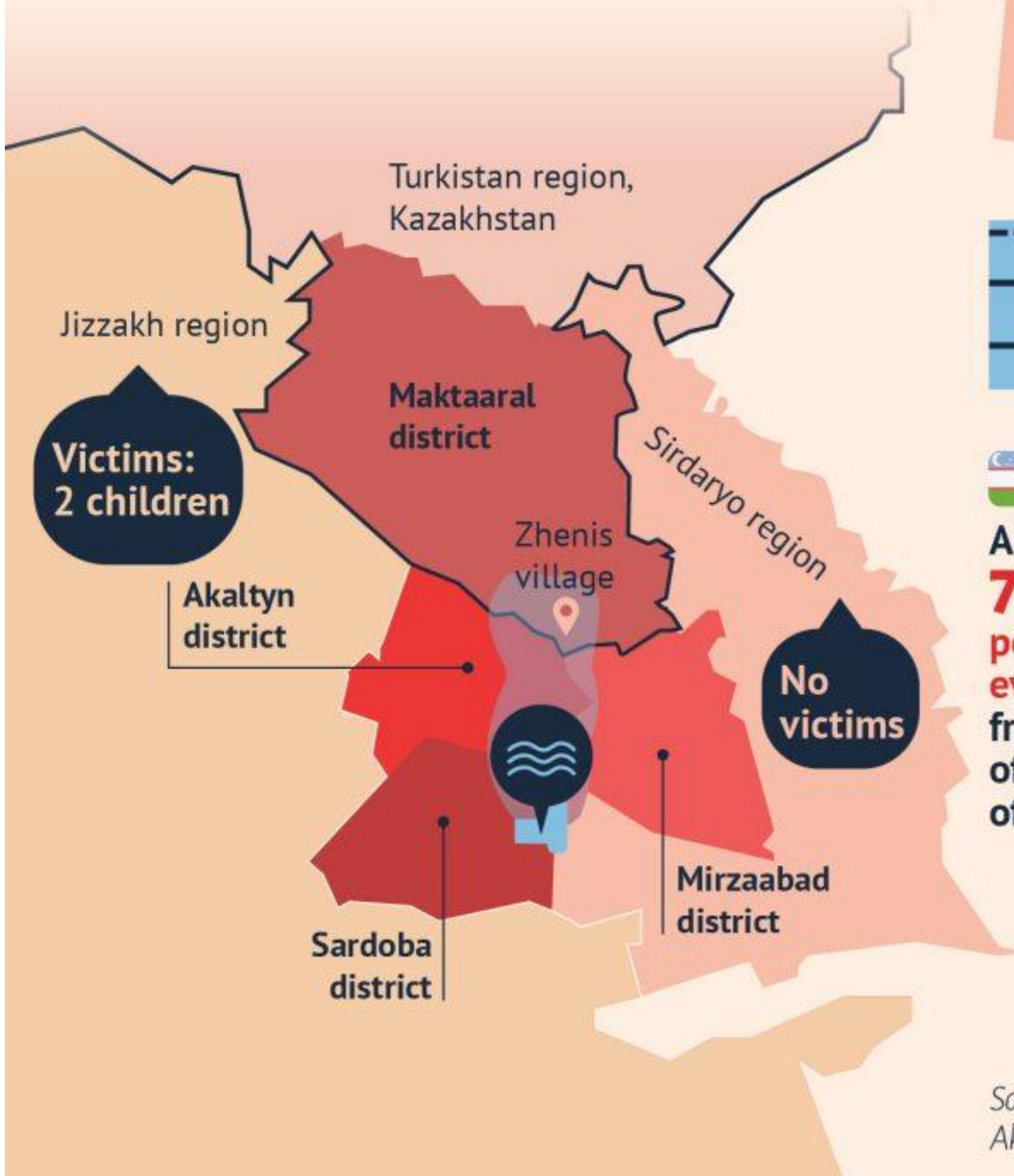
Source of flood information: http://floodobservatory.colorado.edu/Version3/MasterListrev.htm

Source of Covid information: https://en.wikipedia.org/wiki/COVID-19_pandemic_by_country_and_territory#Europe

Heavy rains and stormy winds on 1 May 2020 caused a Sardoba dam wall in Uzbekistan to collapse partially, flooding a large land area in both Uzbekistan and Kazakhstan, with the number of evacuees in excess of 100 thousand. Completed in 2017, the dam has a storage capacity of 922 million cubic meters, and is used for irrigating agricultural lands.

SARDOBA DAM COLLAPSE IN UZBEKISTAN

CABAR
Central Asian Bureau for Analytical Reporting



About
70 000
people are evacuated
from 3 districts of Sirdaryo region of Uzbekistan

Over
31 000
people are evacuated
from Maktaaral district of Kazakhstan

845 houses are flooded in 5 villages

7 639 hectares of crops are flooded

Sources: Ministry of Emergency Situations of Uzbekistan, Akimat of Maktaaral district of Kazakhstan.

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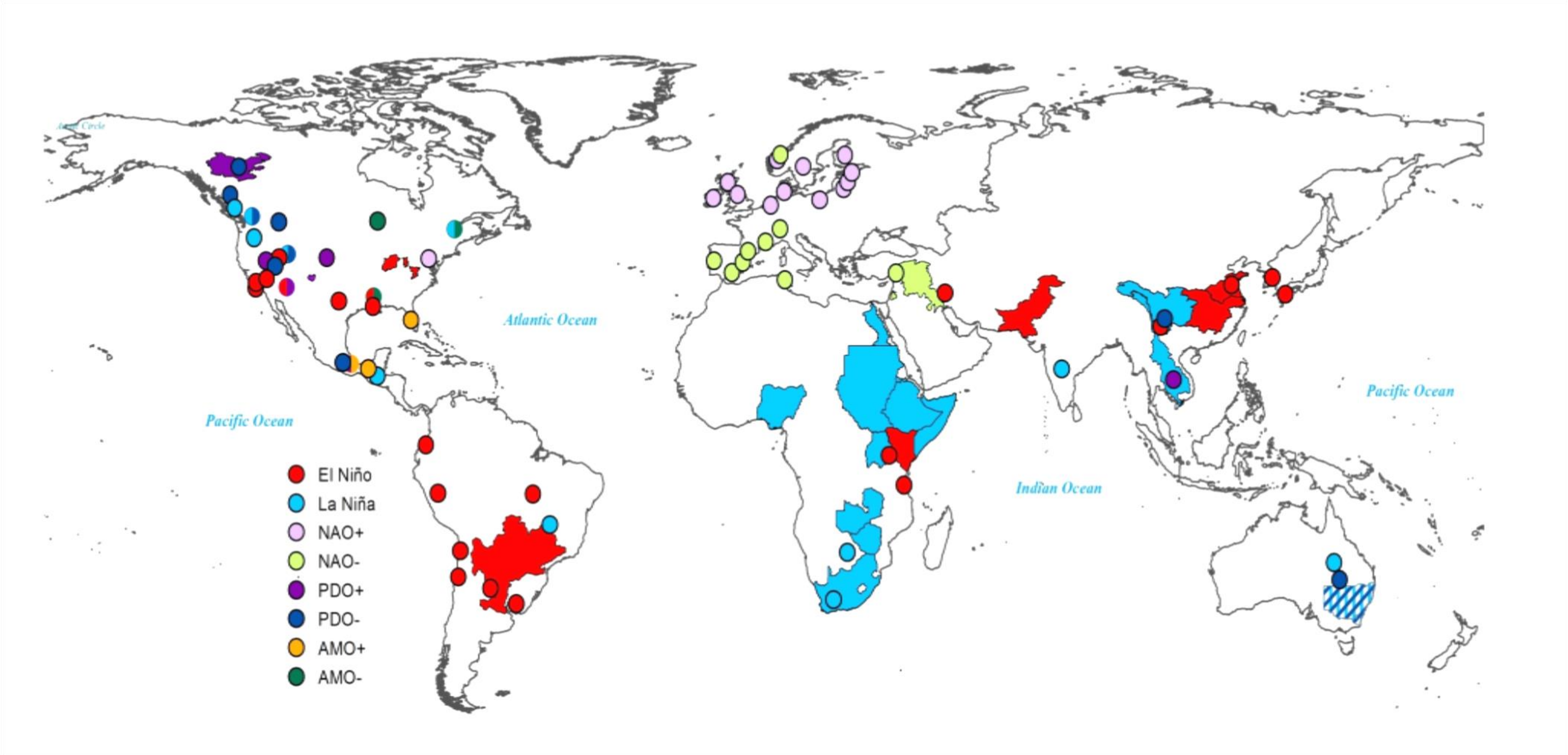
water

Article

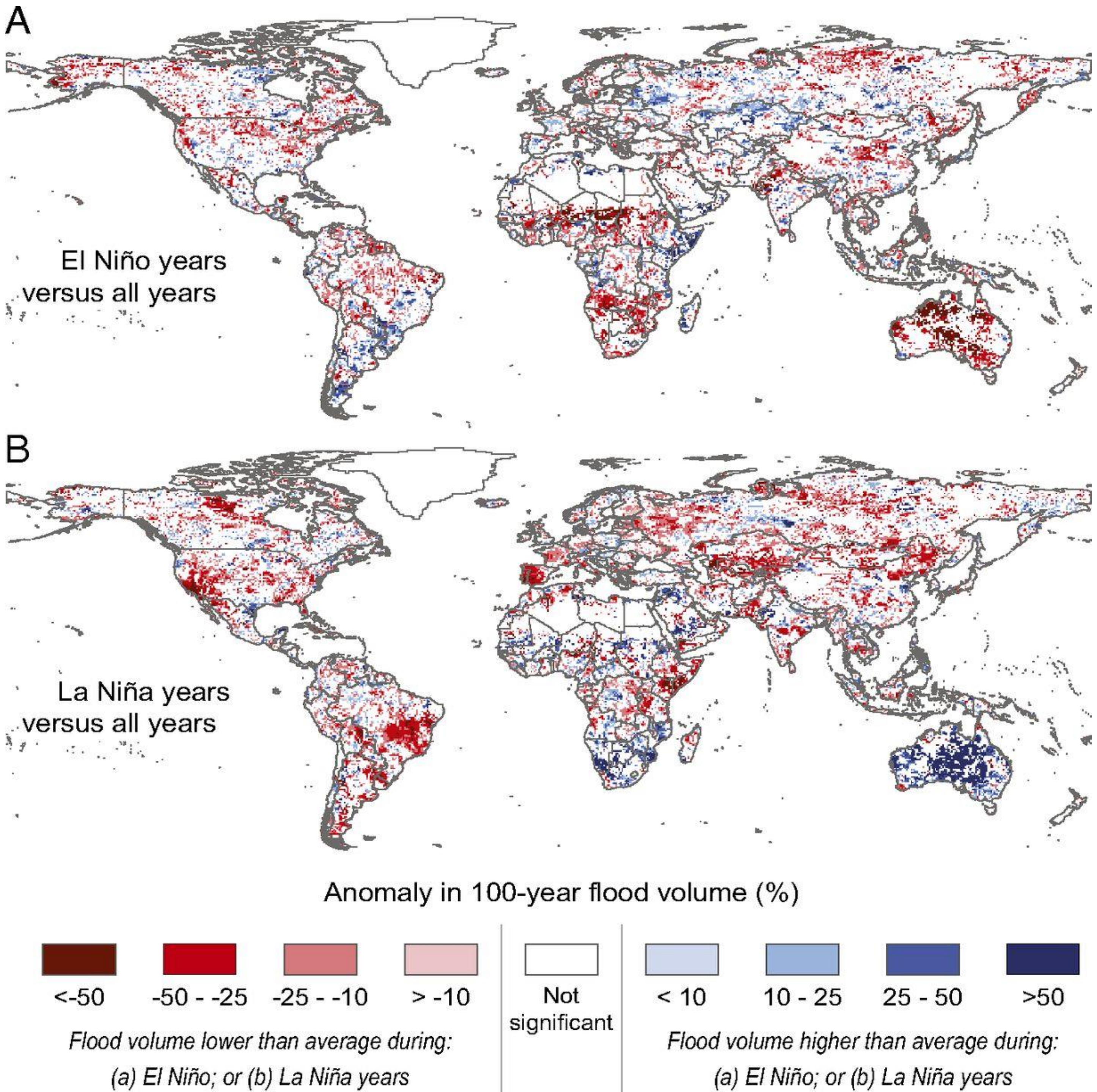
Climate Variability and Floods—A Global Review

Zbigniew W. Kundzewicz, Małgorzata Szwed and Iwona Pińskwar *

Water **2019**, *11*(7), 1399;
https://doi.org/10.3390/w11071399



Map of regional predisposition to abundance of water. Source: Kundzewicz et al. (2019)



Source:
Ward et al.
(2014)

Historical El Niño and La Niña Episodes Based on the ONI computed using ERSST.v5

2015	0.6	0.6	0.6	0.8	1.0	1.2
	1.5	1.8	2.1	2.4	2.5	2.6
2016	2.5	2.2	1.7	1.0	0.5	0.0
	-0.3	-0.6	-0.7	-0.7	-0.7	-0.6
2017	-0.3	-0.1	0.1	0.3	0.4	0.4
	0.2	-0.1	-0.4	-0.7	-0.9	-1.0
2018	-0.9	-0.8	-0.6	-0.4	-0.1	0.1
	0.1	0.2	0.4	0.7	0.9	0.8
2019	0.8	0.8	0.8	0.8	0.6	0.5
	0.3	0.1	0.1	0.3	0.5	0.5
2020	0.5	0.6	0.5			

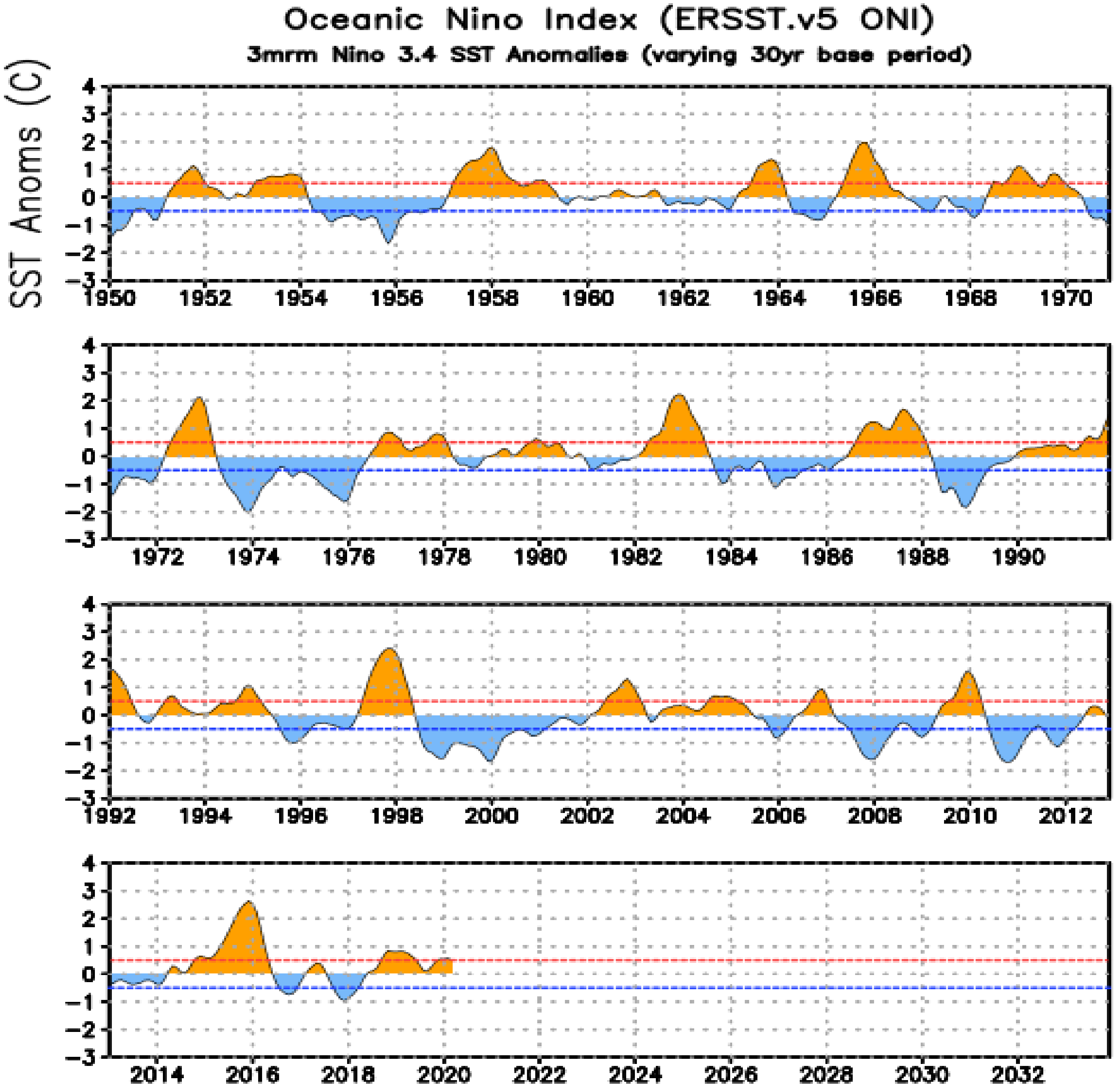
Source:

ENSO: Recent Evolution, Current Status and Predictions.

Climate Prediction Center / NCEP.

11 May 2020

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf



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www.sciencemag.org SCIENCE VOL 319 1 FEBRUARY 2008
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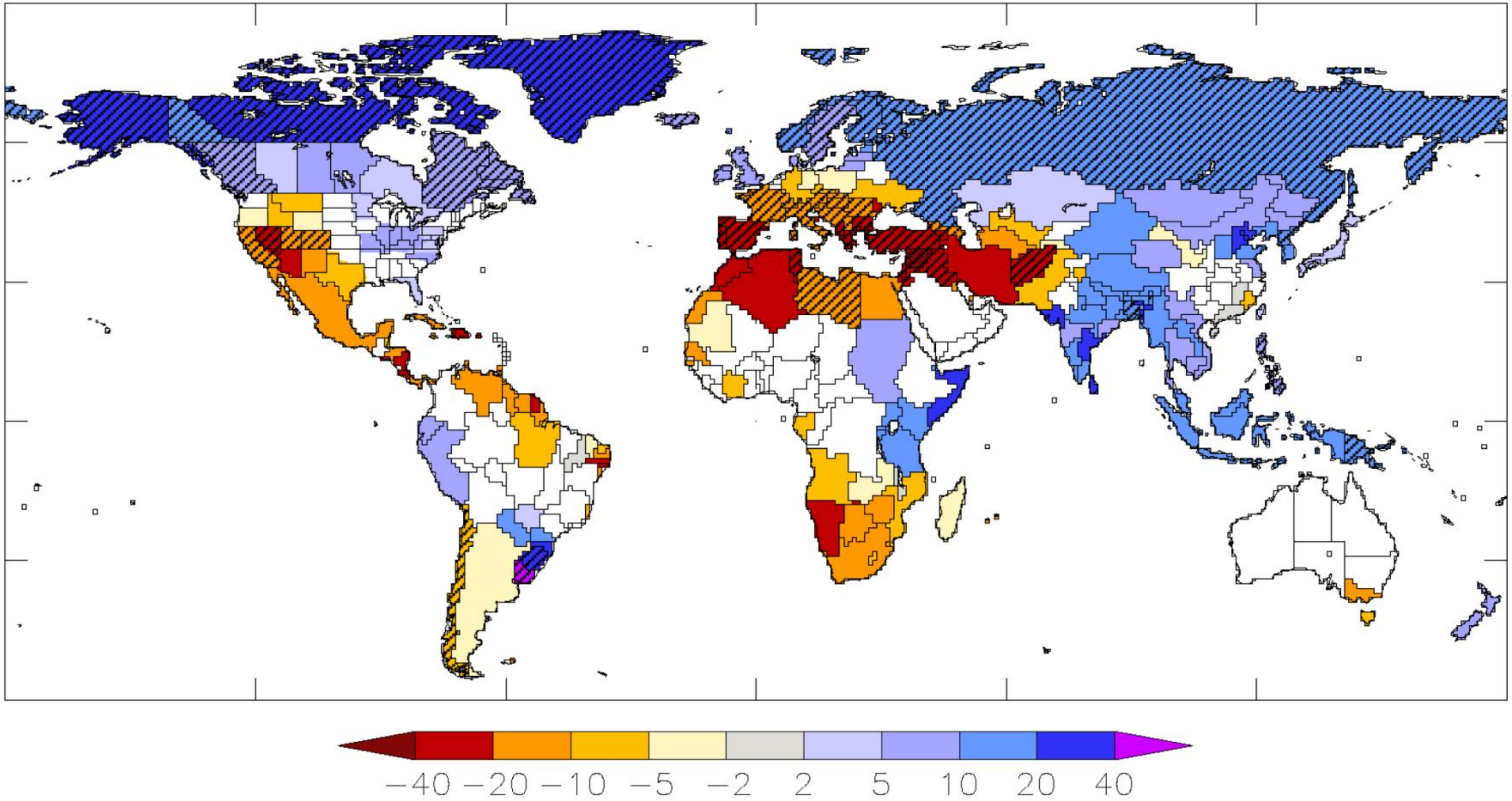
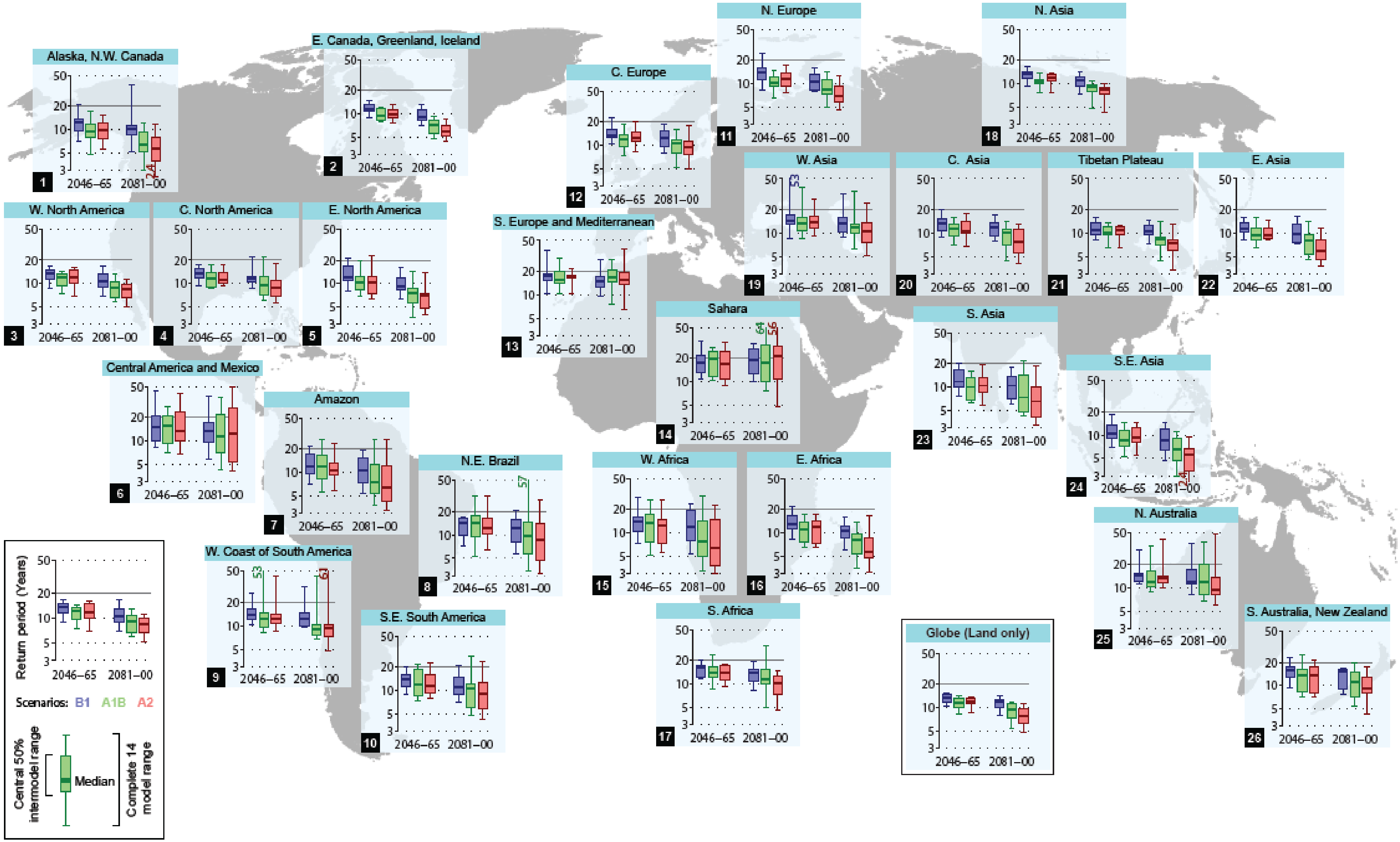
Stationarity Is Dead: Whither Water Management?

P. C. D. Milly,[1*] Julio Betancourt,[2] Malin Falkenmark,[3] Robert M. Hirsch,[4] Zbigniew W. Kundzewicz,[5] Dennis P. Lettenmaier,[6] Ronald J. Stouffer[7]

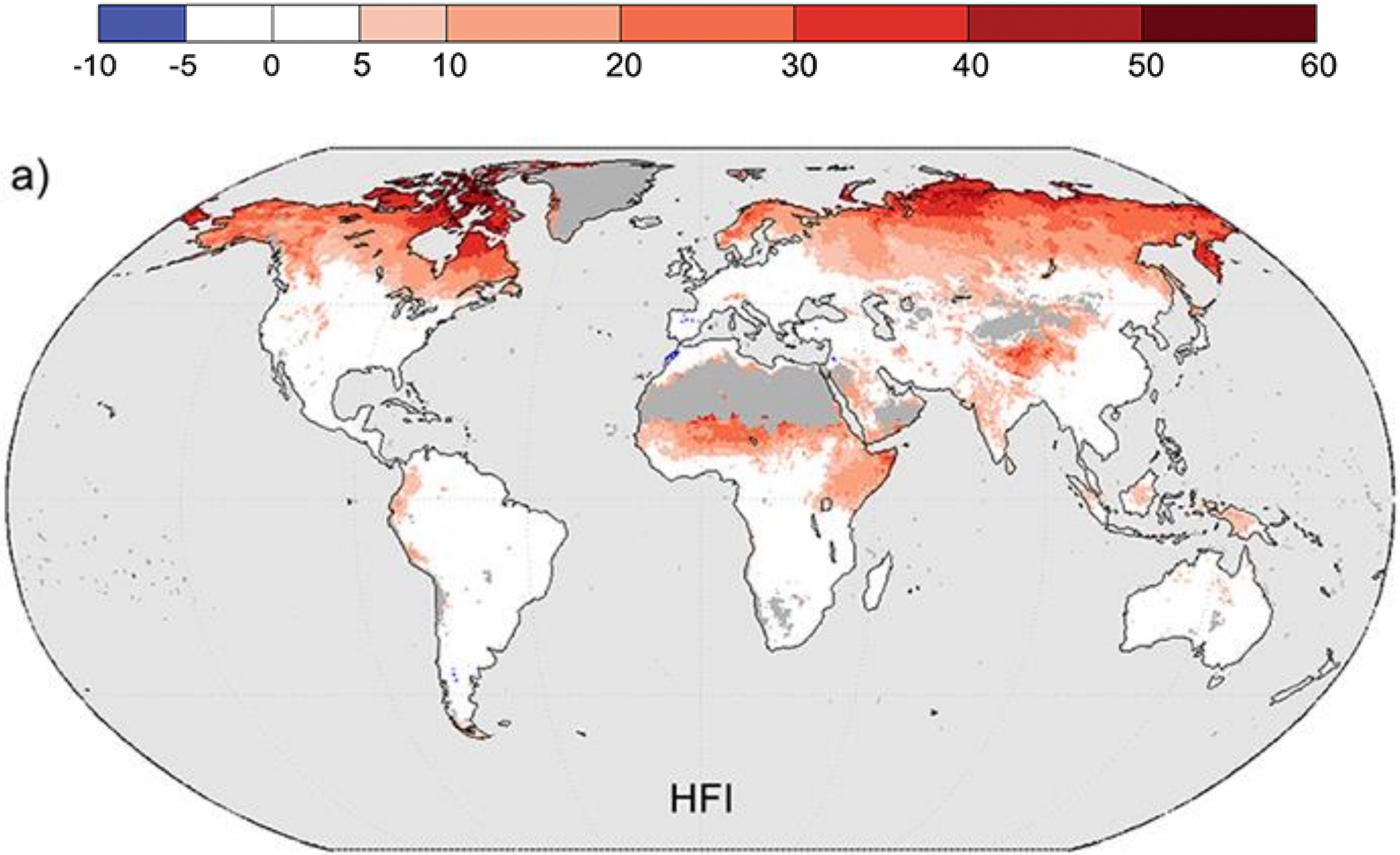


Projection of changes in annual runoff (2041-2060 vs. 1900-1970), for SRES A1B.

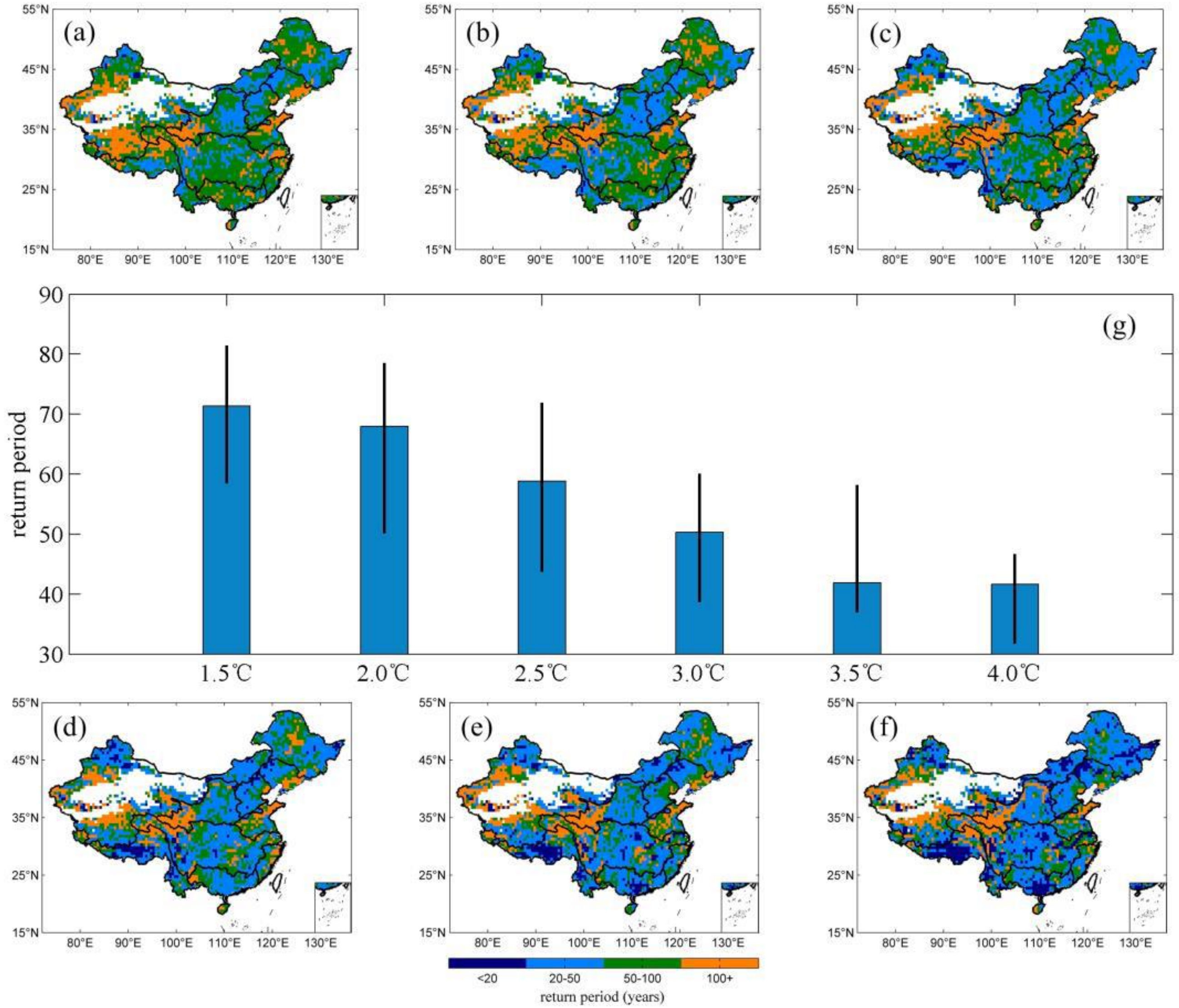
The frequency of heavy precipitation or the proportion of total rainfall from intense events will likely increase over many areas of the globe.



Projected return period (in years) of late 20th-century 20-year return values of annual maximum 24-hour precipitation rates. [Source: Seneviratne et al. (2012), based on Kharin et al. (2007).]



Change in the frequency (in %) of days under high flow conditions for the period 2066–2099 relative to 1972–2005, based on a multi-model ensemble (MME) experiment under RCP8.5 from five GCMs and six GHMs **(**MME mean change). Source: Giuntoli et al. (2015)

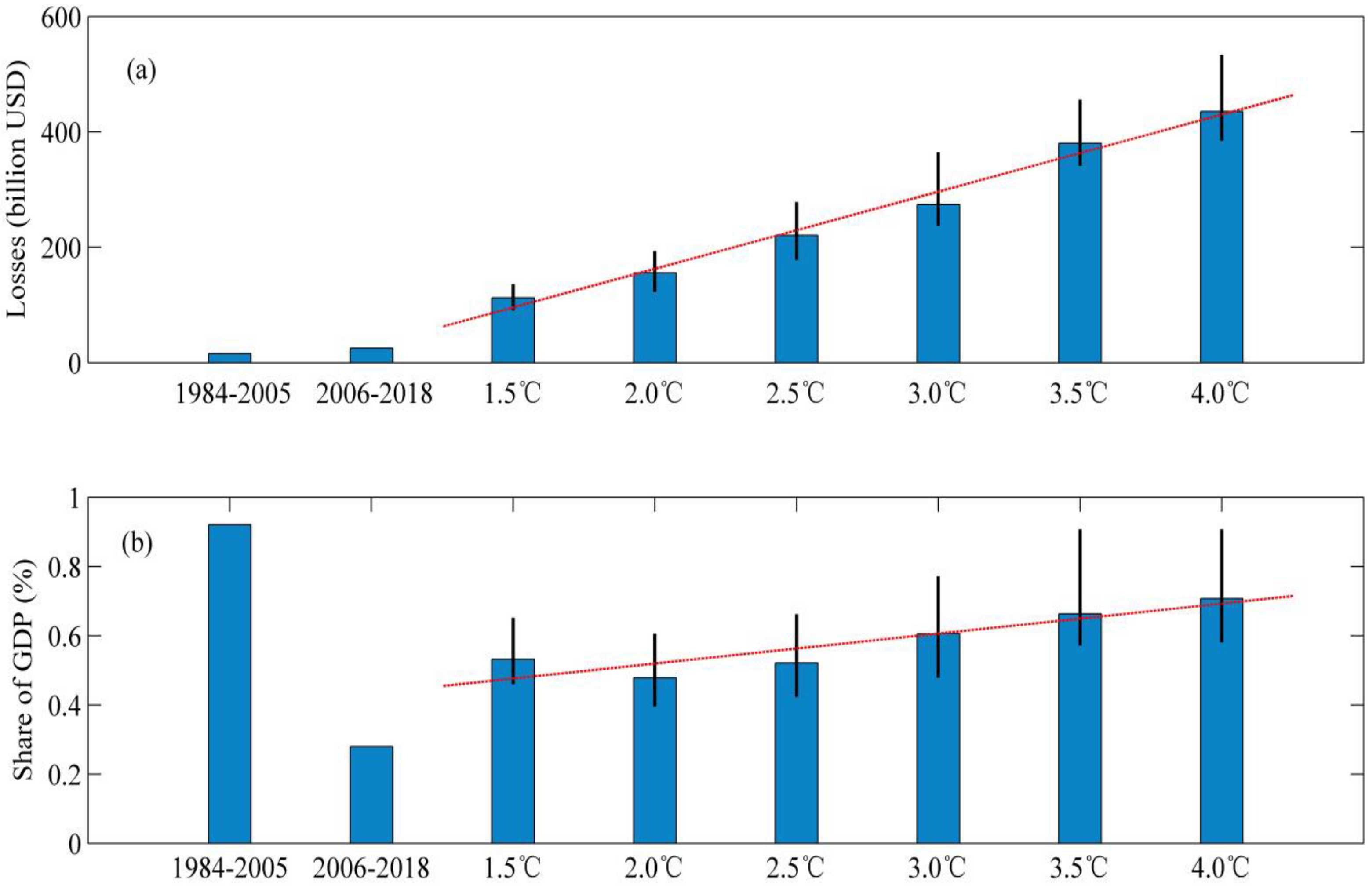


Projected return period of 100-year floods (corresponding to the reference period, 1981–2010) under (a) 1.5°C, (b) 2.0°C, (c) 2.5°C, (d) 3.0°C, (e) 3.5°C and (f) 4.0°C global warming scenarios for China by median of multi-GCM-driven results. Histograms and error bars in (g) are the medians and interquartile ranges of GCM results. White regions denote bare land (desert and sandy land, with very low damage potential).

Source: Each 0.5 ^{o}C **of warming increases annual flood losses in China by more than 60 billion USD.**

Tong Jiang, Buda Su, Jinlong Huang, Jianqing Zhai, Jun Xia, Hui Tao, Yanjun Wang, Hemin Sun, Yong Luo, Liping Zhang, Guojie Wang, Chesheng Zhan, Ming Xiong, Zbigniew W. Kundzewicz

BAMS, June 2020 DOI 10.1175/BAMS-D-19-0182.1



(a) Flood losses and (b) their share of GDP in China for the periods 1984–2018 and global warming of 1.5°C, 2.0°C, 2.5°C, 3.0°C, 3.5°C and 4.0°C. Histograms for the periods 1984-2005 and 2006-2018 are the recorded values. Histograms and error bars are the medians and interquartile ranges of GCM results. Red lines are the linear trends of flood losses or their share of GDP under the warming climate.

Source: Each 0.5 °C of warming increases annual flood losses in China by more than 60 billion USD.
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Thank you for attention

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