

# Historical analysis of global distribution of and trends in wind droughts

**Enrico Antonini**

Carnegie Institution for Science, Stanford, CA, USA

European Institute on Economics and the Environment (EIEE), Milan, MI, ITA

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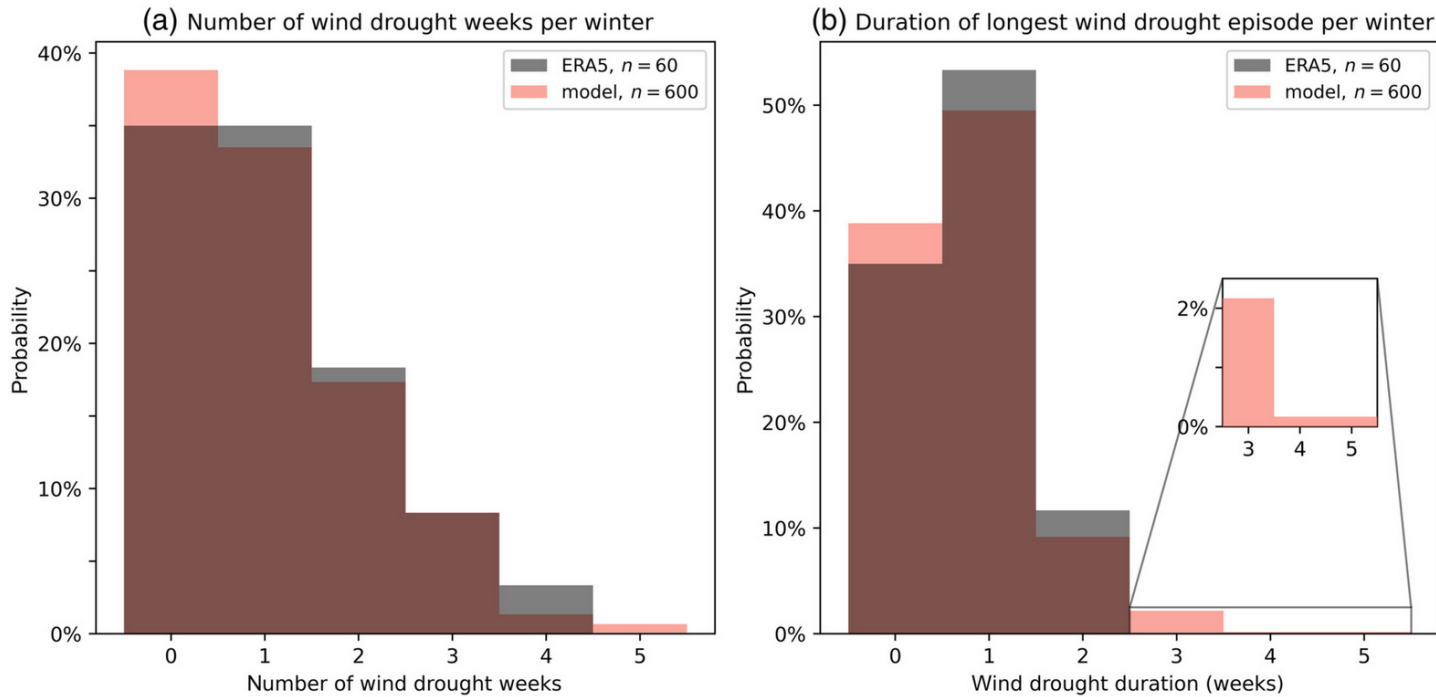
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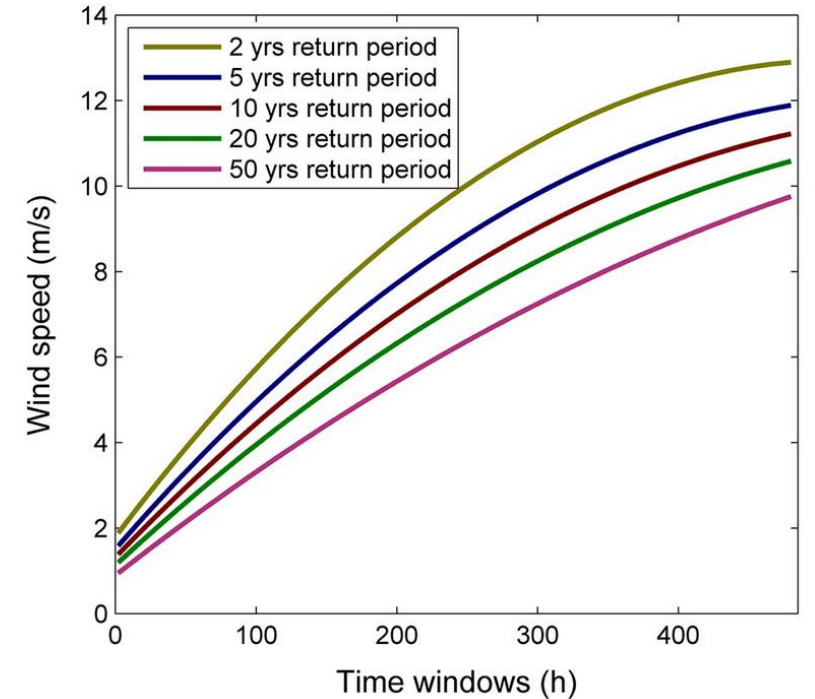
**Jillian Ambrose** *Energy correspondent*

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# Intensity–duration–frequency analyses to characterize wind droughts



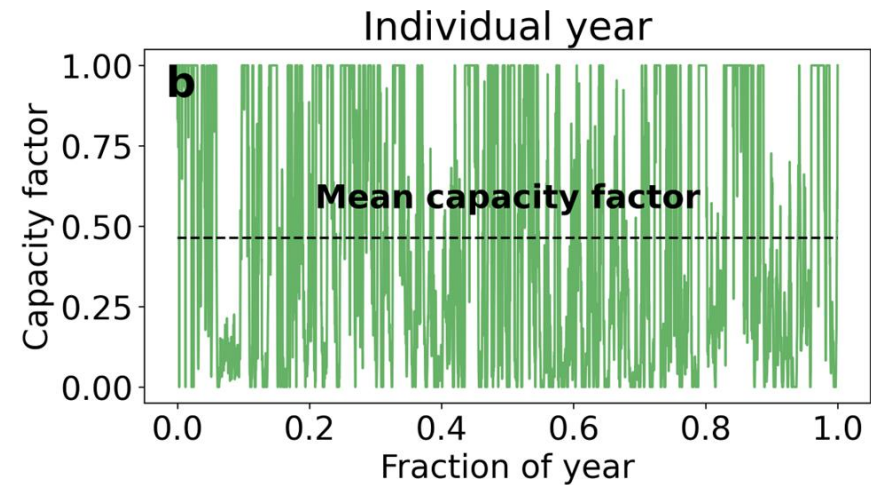
Kay et al., Atmospheric Science Letters 2023



Patlakas et al., Wind Energy 2017

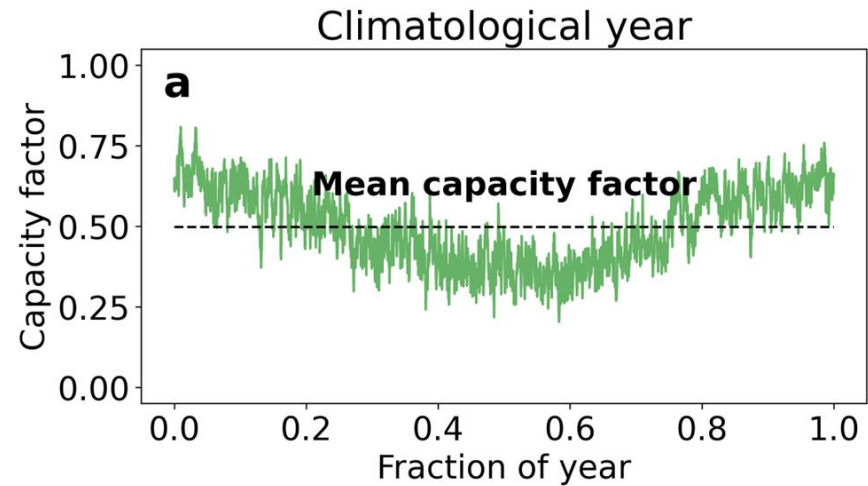
# Energy deficit to characterize wind droughts

N years in the historical record



Actual generation

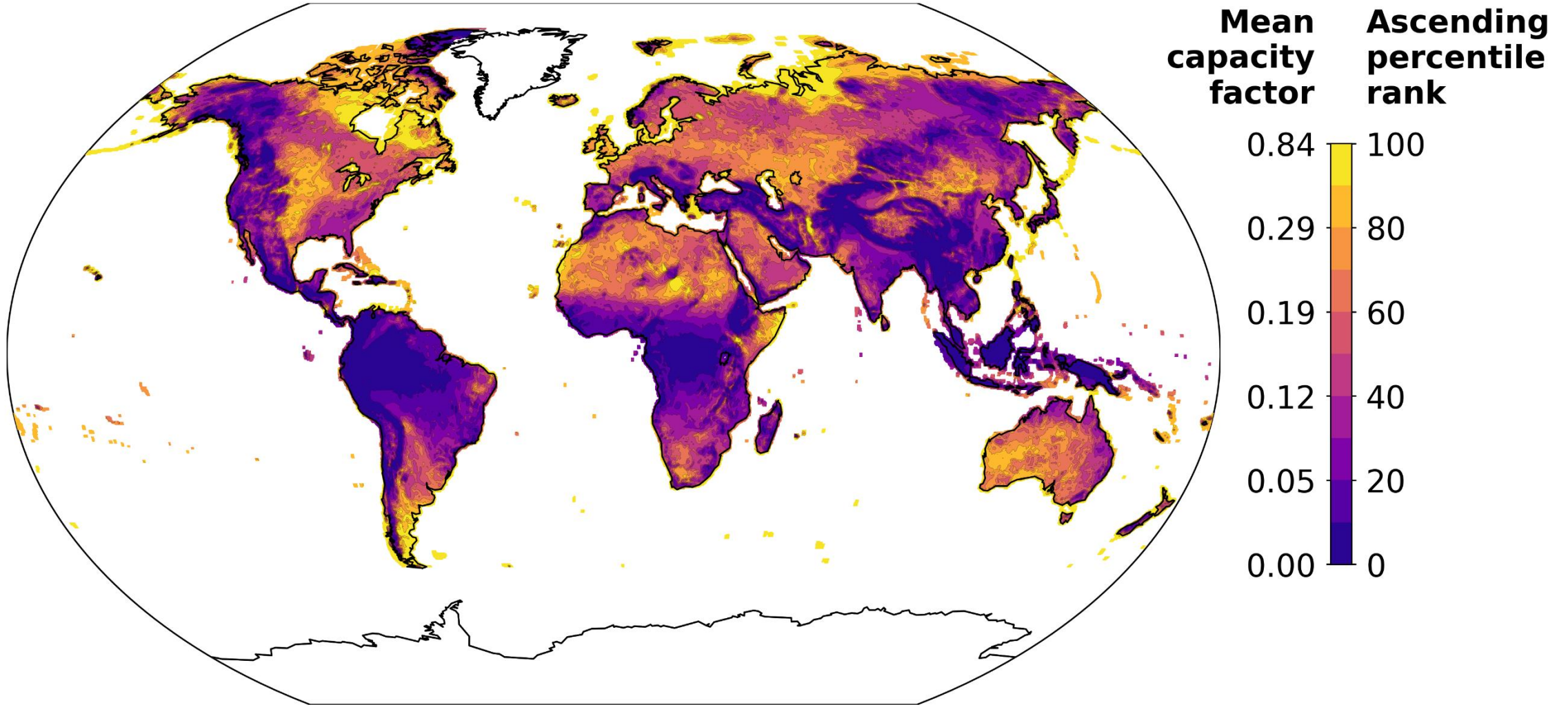
Mean profile of the N years



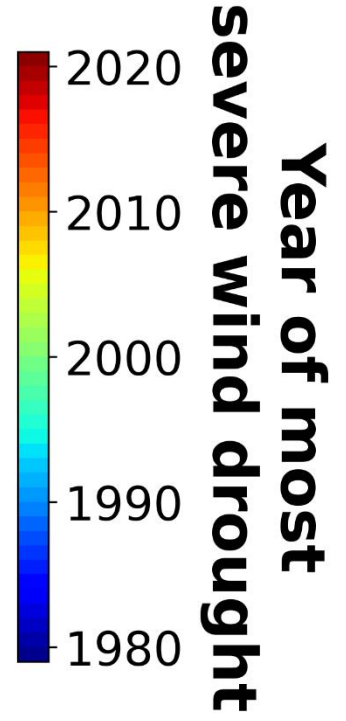
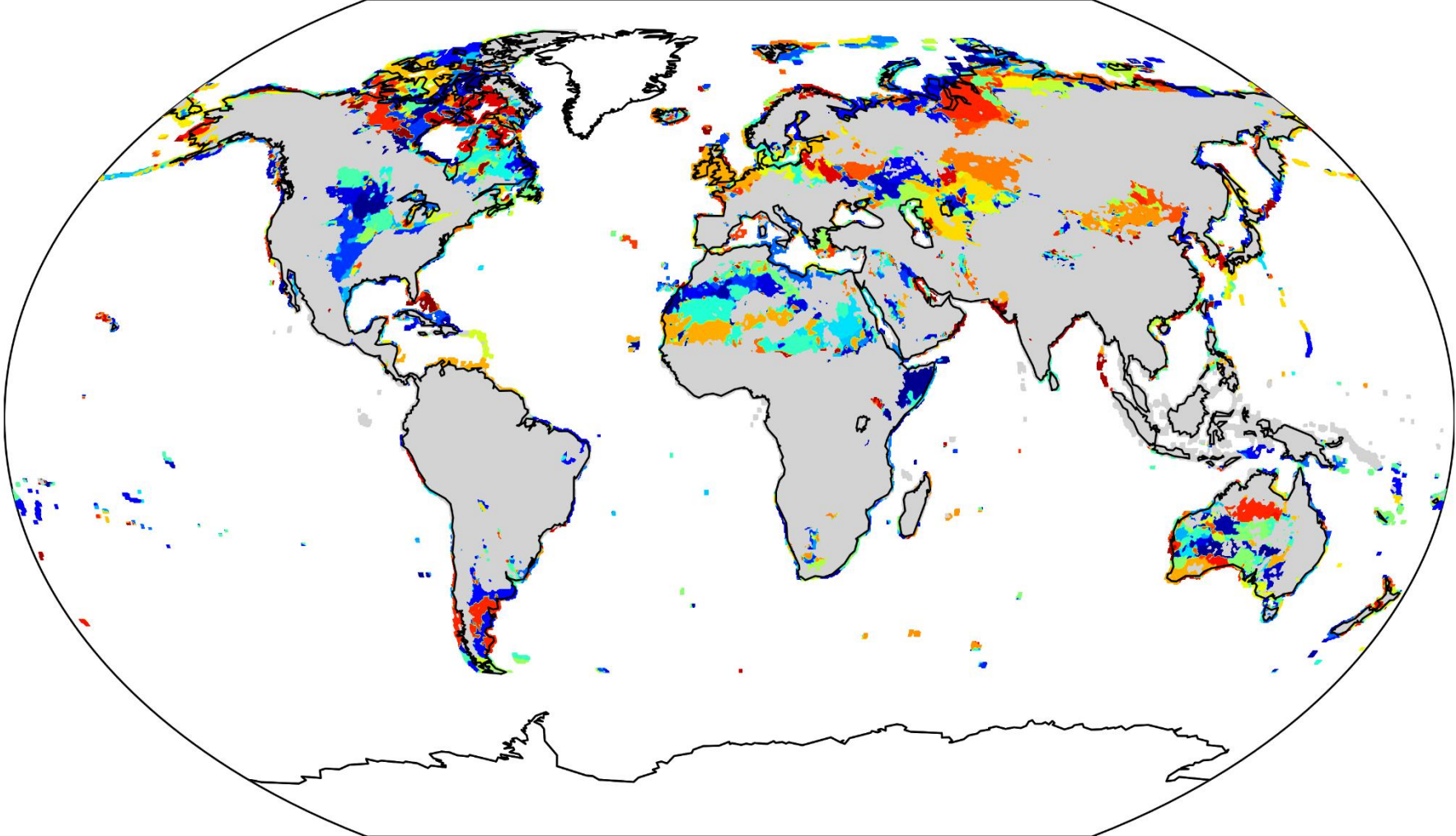
Expected generation



# Mean capacity factor

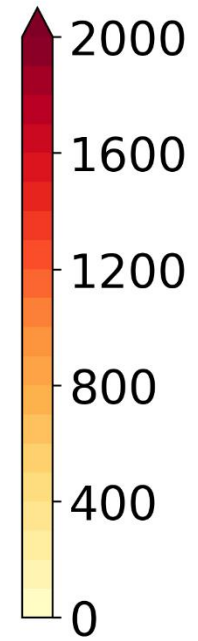
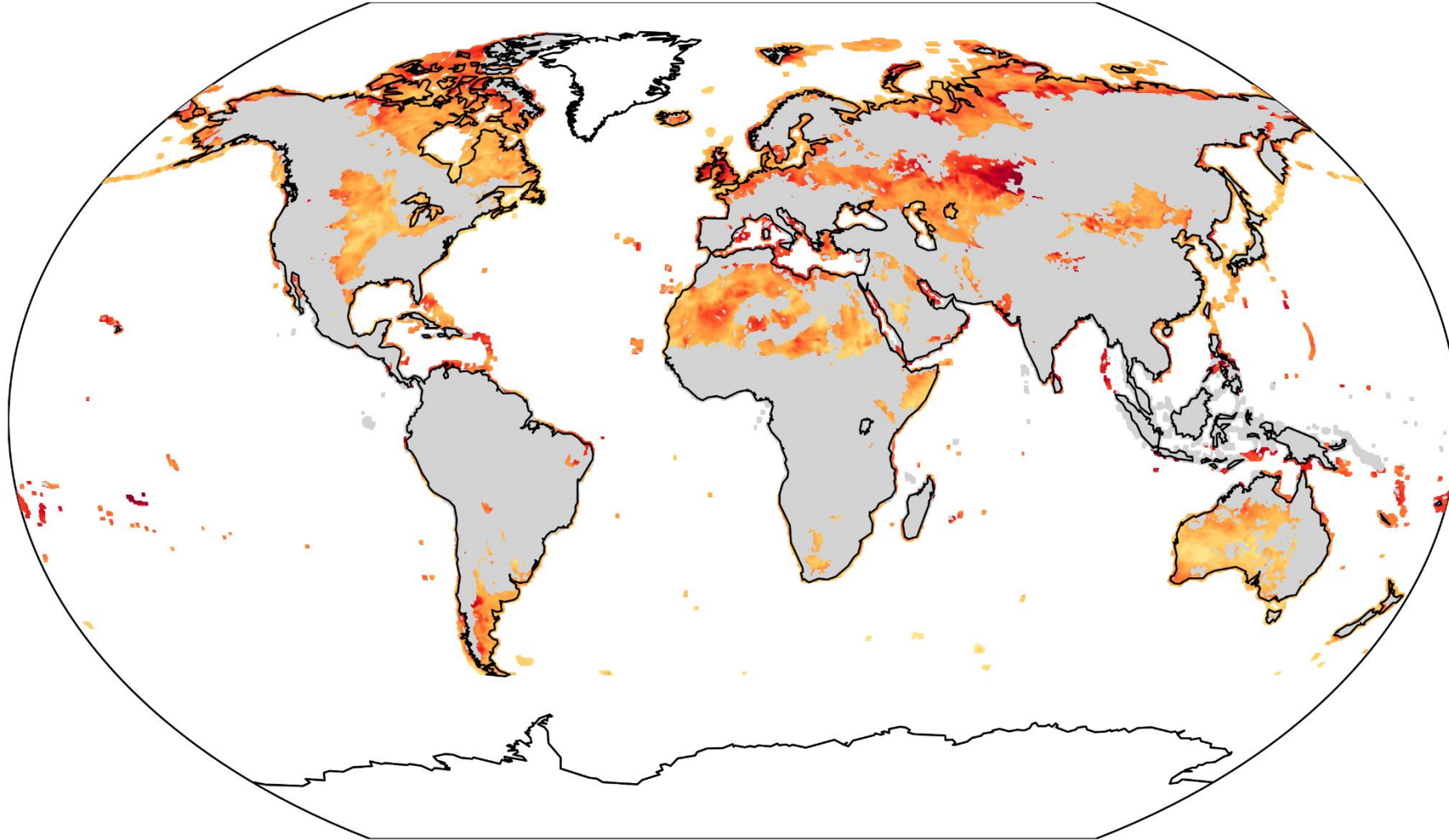


# Year of most severe wind drought



Regions with a mean capacity factor less than 0.2

# Intensity of most severe wind drought

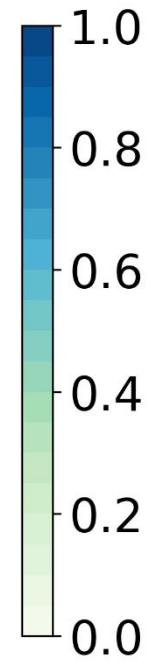
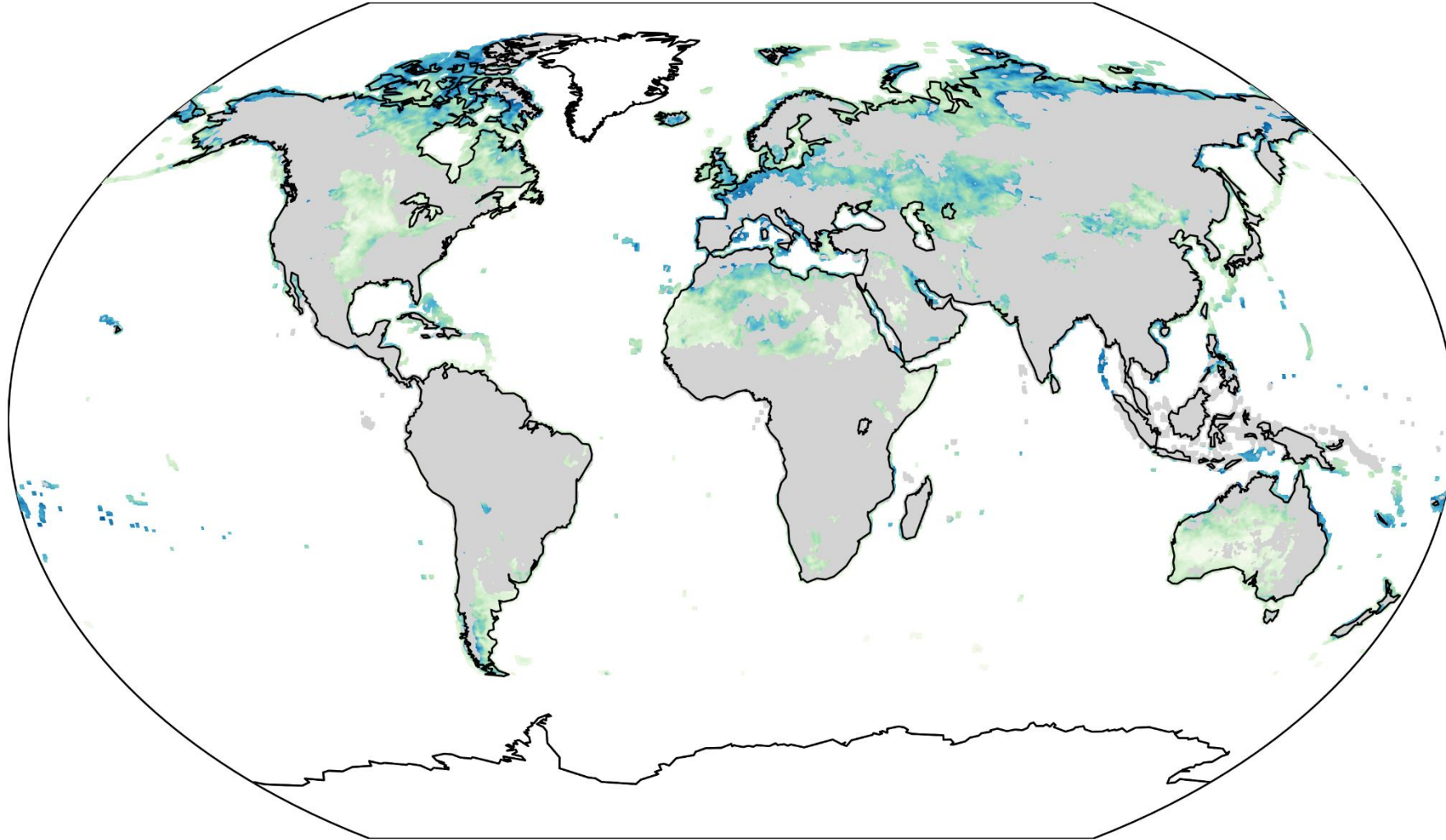


**Intensity of most  
severe wind drought**  
[hours of energy deficit]

Regions with a mean capacity factor less than 0.2



# Probability of a wind drought causing more than 400 hours of energy deficit



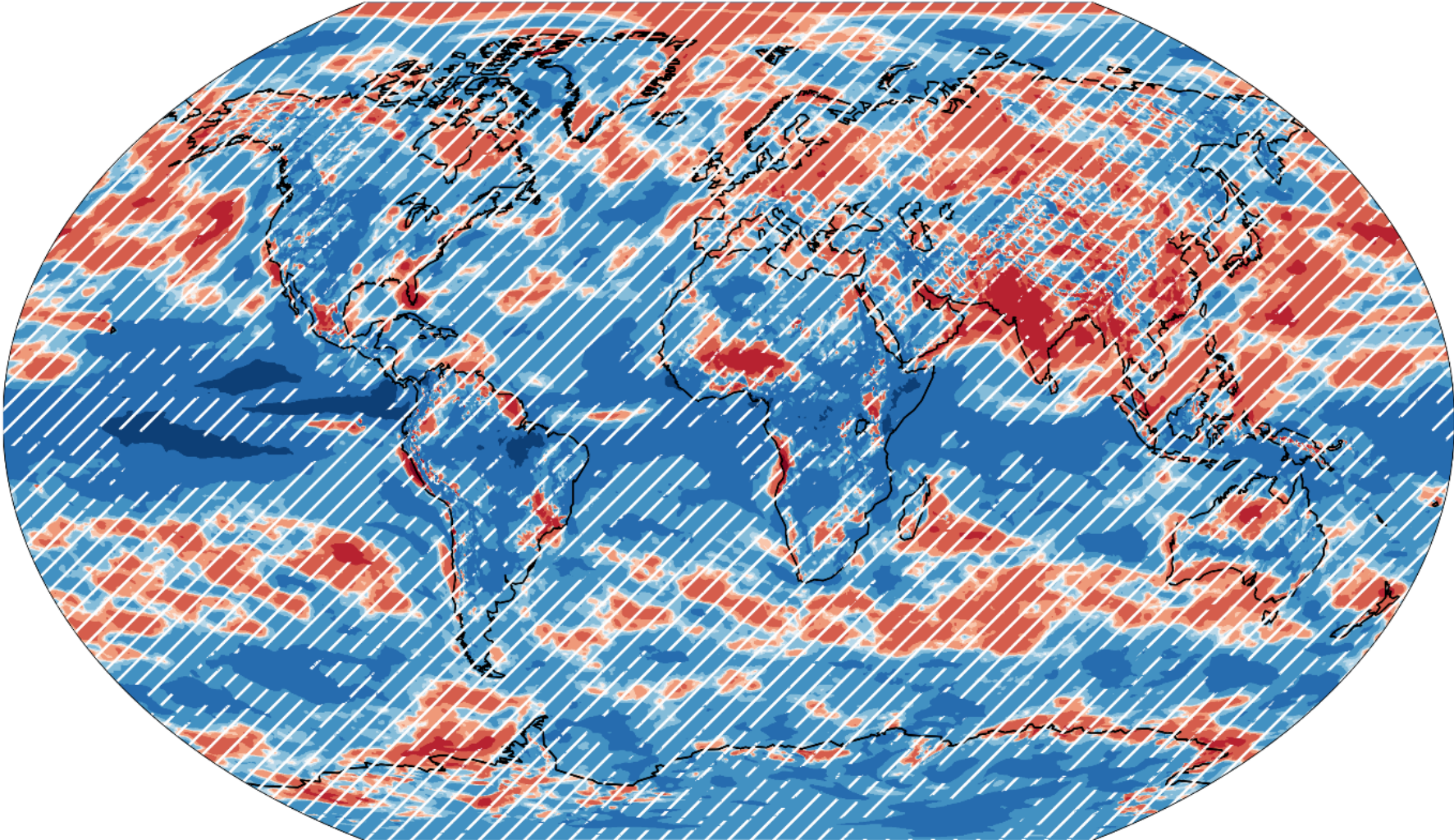
**Probability of a wind drought causing more than 400 hours of energy deficit**

Regions with a mean capacity factor less than 0.2





# Annual percentage change in wind drought intensity



**Annual  
percentage change in  
wind drought intensity**

10.00  
1.00  
0.10  
0.01  
-0.01  
-0.10  
-1.00  
-10.00



# Thanks

*Contact information:*

*Enrico Antonini*  
*enrico.antonini@eiee.org*

