Update on identification of relevant climatic information C3S/NEN study 2018

Variable	*Probability for extremes*	*Temporal resolution*	*Dura-tion*	*Accumula tion*	*Spatial resolution (km²)*	*Remarks 2018*	*Relevant Y/N*	*Remarks 2020 and/or more specified insight* *(for instance more detail on what information is most relevant)*
Temperature (high/low)	1/10 – 1/500 yr		✓		1-10	Special focus on heat-waves Special focus on night temperatures	Y	Average temperatures[1]
Rain		10 – 15 minutes		✓	1-10		Y	Intensive rains[1]
Snow				✓	1-10		Y	There is no indication what snow parameter is meant. Snow depth would not fit the needs for structural EC (snao as an action). Either water equivalent of the snow layer (alone) or snow depth and snow density are needed.[2]
Humidity			✓		50		Y	Average humidity important for deterioration. Higher spatial resolution would be beneficial[3].
Solar radiation			✓		1-10		Y	
Wind					50		Y	Is this information useful at this scale? How to downscale it to apply it for example to a bridge?[4]
Wind gust		3 secs			50		Y	Is this information useful at this scale? How to downscale it to apply it for example to a bridge?[4]
Hail					1-10	Special focus on size of hailstones	Y	
'consequences'							Y	

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[2] Contributor: Bodo Wichura, DWD (Deutsche Wetter Dienst)
[3] Contributor: Boulent Imam, University of Surrey
[4] Contributor: Emilio Bastidas, University of Minho

Flood	✓			✓	1-10	Strongly dependent on local conditions; e.g. different types of flood	Y	
Drought	✓			✓		Strongly dependent on local conditions	Y	
Air quality	✓		✓			Strongly dependent on local conditions	Y	
Slow-onset effects								
Sea level							Y	
Salination						Strongly dependent on local conditions	Y	
Desertification						Strongly dependent on local conditions	Y	
Additional suggestions								
River Flow[1]			✓		1-10		Y	Hydraulic effects on infrastructures
CO_2 Concentration[1]		Daily	✓		1-10		Y	Concrete carbonation
Soil saturation				✓	1-10		Y	Landslides and loading on earth supporting structures
Atmospheric Icing[2]	1/10-1/100			✓	10-50		Y	Atmospheric icing is noted in 3.1.1.1 of the 2018 report, but nowhere else therein. Probability for extremes of 1/10-1/100 yr seem to be relevant and reasonable. Probability for extremes of >1/100 yr are often asked for. However, their reliability and plausibility needs to be scrutinized with respect to data sources that are available. 'Y' means that climate information about these parameters is certainly relevant, if Eurocodes are on focus in general. They are not necessarily relevant for Structural Eurocodes.
River Flows[3]	1/1-1/500 yr				For individual rivers		Y	Important for assessing hydraulic effects on structures and bridge scour

SO_2 concentration[3]		Daily			1-10		Y	Important for assessing long-term deterioration of metallic structures
Cloud Cover[3]		Daily			1-10		Y	Important for assessing long-term deterioration of some materials
Storm surge[3]								Important for coastal infrastructure
Lightning?[3]								
CO_2 concentration			✓		1-10		Y	Useful to assess concrete carbonation risks[4]
Riverflow			✓		1-10			Useful for scouring analysis[4]

Explanation:
This table shows parameters of future climate identified as relevant for uptake in standards for infrastructures. They are the results of a survey conducted by NEN and BMGI for C3S in 2018. It is based on a broad consultation of TC representatives and other experts.
The table shows in the first column variables that are considered relevant. The second column indicates what kind of information is especially important for these variables, for instance extreme values. The four following columns indicate temporal and spatial resolution preferred, as well as relevance of the issues of duration and accumulation, and the last column gives specific remarks.
It should be noted that the information reflects information preferred. It was not matched with what information could actually be delivered[5].
As discussed in the PT1 meeting of Friday 16 October, we ask you to indicate from your expertise, to check this table. We would be happy to hear whether you still recognize the parameters identified in 2018, and/ or do have new remarks or insights to be added. Also you can add variables that in your opinion are important. The last column indicates 'Remarks 2020 and/or more specified insights'. You can add here remarks regarding the variable indicated, or specify more in depth what kind of information on this variable is most relevant. As an example: in the remarks 2018 for temperature 'heatwaves' is indicated. However, as there may be different ways to define a heatwave and its associated values (duration, intensity, frequency), it would be welcome to get more 'insights' about what is key.

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[5] This seems to be a "weak point. Of course, one can make an inventory what would be needed and would be "nice to have". On the other hand, if results from climate models will per se not be able to deliver the data due to their inherent limits of temporal and/or spatial resolution, the question arises if suchlike inventory leads to the right direction of thinking at the involved stakeholders.