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Effects of black carbon mitigation on Arctic climate

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(a)	PM effect in AC		
	2010	2030	2050
CLE	179754	160334	176021
AC	179754	130651	134966
AC_ACT	179754	130039	134481
AC_ALL	179754	129542	133913
GLOB	179754	124025	126563

(b)	PM effect in AC relative to CLE		
	2010	2030	2050
CLE	100 %	100 %	100 %
AC	100 %	81 %	77 %
AC_ACT	100 %	81 %	76 %
AC_ALL	100 %	81 %	76 %
GLOB	100 %	77 %	72 %

(c)	PM effect in AC -- absolute difference to CLE		
	2010	2030	2050
CLE	0	0	0
AC	0	-29683	-41055
AC_ACT	0	-30295	-41540
AC_ALL	0	-30792	-42109
GLOB	0	-36309	-49459

(d)

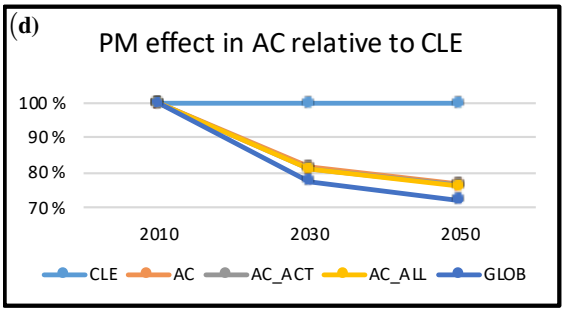

Figure S1. Health effects of the different emission scenarios in the Arctic Council member states: (a) total amount of predicted premature deaths, (b) relative amount of premature deaths relative to the CLE scenario (c) reduction in amount of premature deaths compared to the CLE scenario (d) visualisation of (b).

(a)	PM effect in AC_ACT		
	2010	2030	2050
CLE	1218984	1724921	2339489
AC	1218984	1694536	2296683
AC_ACT	1218984	1555891	2133828
AC_ALL	1218984	1553119	2130626
GLOB	1218984	1495734	2070535

(b)	PM effect in AC_ACT relative to CLE		
	2010	2030	2050
CLE	100 %	100 %	100 %
AC	100 %	98 %	98 %
AC_ACT	100 %	90 %	91 %
AC_ALL	100 %	90 %	91 %
GLOB	100 %	87 %	89 %

(c)	PM effect in AC_ACT -- absolute difference to CLE		
	2010	2030	2050
CLE	0	0	0
AC	0	-30385	-42806
AC_ACT	0	-169030	-205661
AC_ALL	0	-171802	-208864
GLOB	0	-229187	-268955

(d)

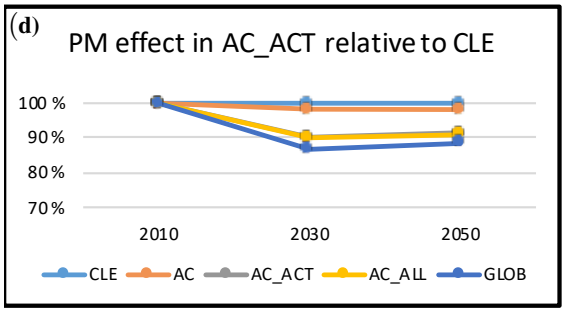

Figure S2. Health effects of the different emission scenarios in the Arctic Council member states and active observer states: (a) total amount of predicted premature deaths, (b) relative amount of premature deaths relative to the CLE scenario (c) reduction in amount of premature deaths compared to the CLE scenario (d) visualisation of (b).

(a)	PM effect in AC_ALL		
	2010	2030	2050
CLE	2603523	3556938	4268064
AC	2603523	3524572	4222278
AC_ACT	2603523	3384710	4058209
AC_ALL	2603523	3238867	3901920
GLOB	2603523	3177276	3835617

(b)	PM effect in AC_ALL relative to CLE		
	2010	2030	2050
CLE	100 %	100 %	100 %
AC	100 %	99 %	99 %
AC_ACT	100 %	95 %	95 %
AC_ALL	100 %	91 %	91 %
GLOB	100 %	89 %	90 %

(c)	PM effect in AC_ALL -- abolute difference to CLE		
	2010	2030	2050
CLE	0	0	0
AC	0	-32366	-45786
AC_ACT	0	-172228	-209855
AC_ALL	0	-318071	-366145
GLOB	0	-379662	-432448

(d)

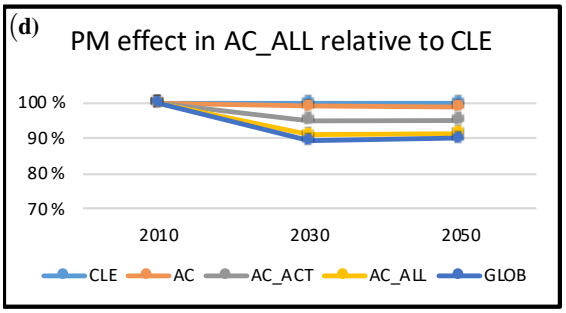

Figure S3. Health effects of the different emission scenarios in the Arctic Council member states and all observer states: (a) total amount of predicted premature deaths, (b) relative amount of premature deaths relative to the CLE scenario (c) reduction in amount of premature deaths compared to the CLE scenario (d) visualisation of (b).

(a)	global PM effect		
	2010	2030	2050
CLE	2670268	3683160	4479682
AC	2670268	3650146	4432959
AC_ACT	2670268	3504835	4243508
AC_ALL	2670268	3354531	4077330
GLOB	2670268	3280531	3972620

(b)	global PM effect relative to CLE		
	2010	2030	2050
CLE	100 %	100 %	100 %
AC	100 %	99 %	99 %
AC_ACT	100 %	95 %	95 %
AC_ALL	100 %	91 %	91 %
GLOB	100 %	89 %	89 %

(c)	global PM effect -- absolute difference to CLE		
	2010	2030	2050
CLE	0	0	0
AC	0	-33014	-46723
AC_ACT	0	-178326	-236174
AC_ALL	0	-328630	-402352
GLOB	0	-402629	-507063

(d)

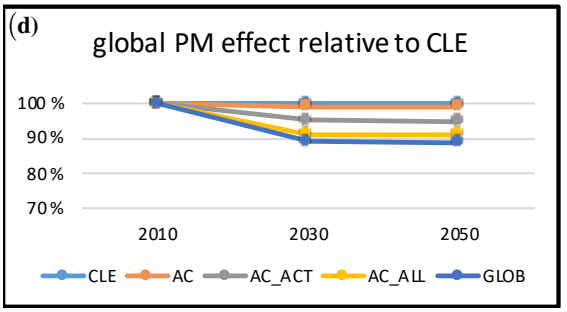

Figure S4. Global health effects of the different emission scenarios: (a) total amount of predicted premature deaths, (b) relative amount of premature deaths relative to the CLE scenario (c) reduction in amount of premature deaths compared to the CLE scenario (d) visualisation of (b).

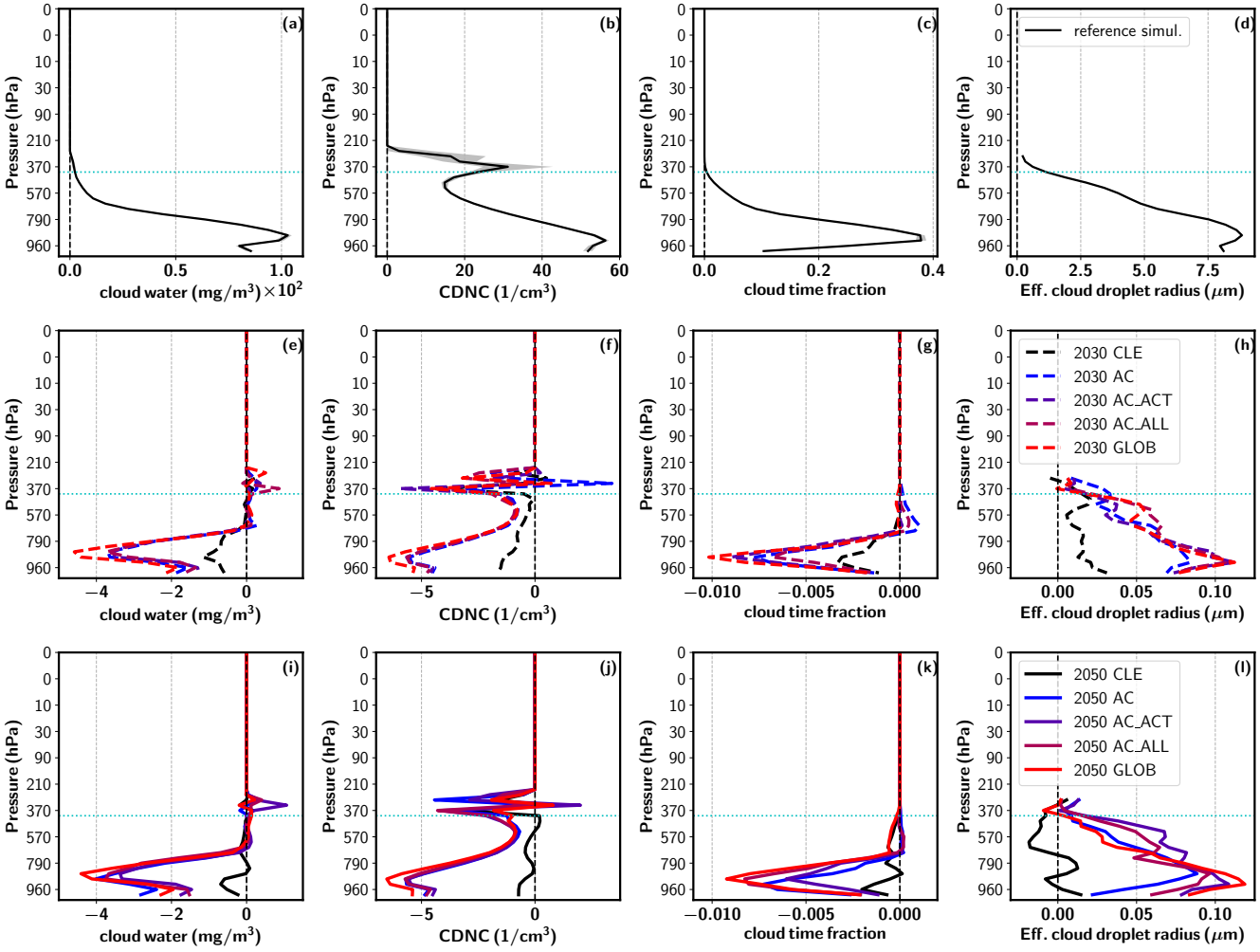

Figure S5. Arctic water clouds in the simulations. The different columns show cloud water, CDNC, water cloud time fraction, and the cloud droplet effective radius, respectively. The top row shows the values for 2010, the middle row shows the changes betweed 2010 and 2030, and the bottom row shows the changes between 2010 and 2050. Cloud water, CDNC, and cloud droplet effective radius are weighted by the water cloud time fraction.

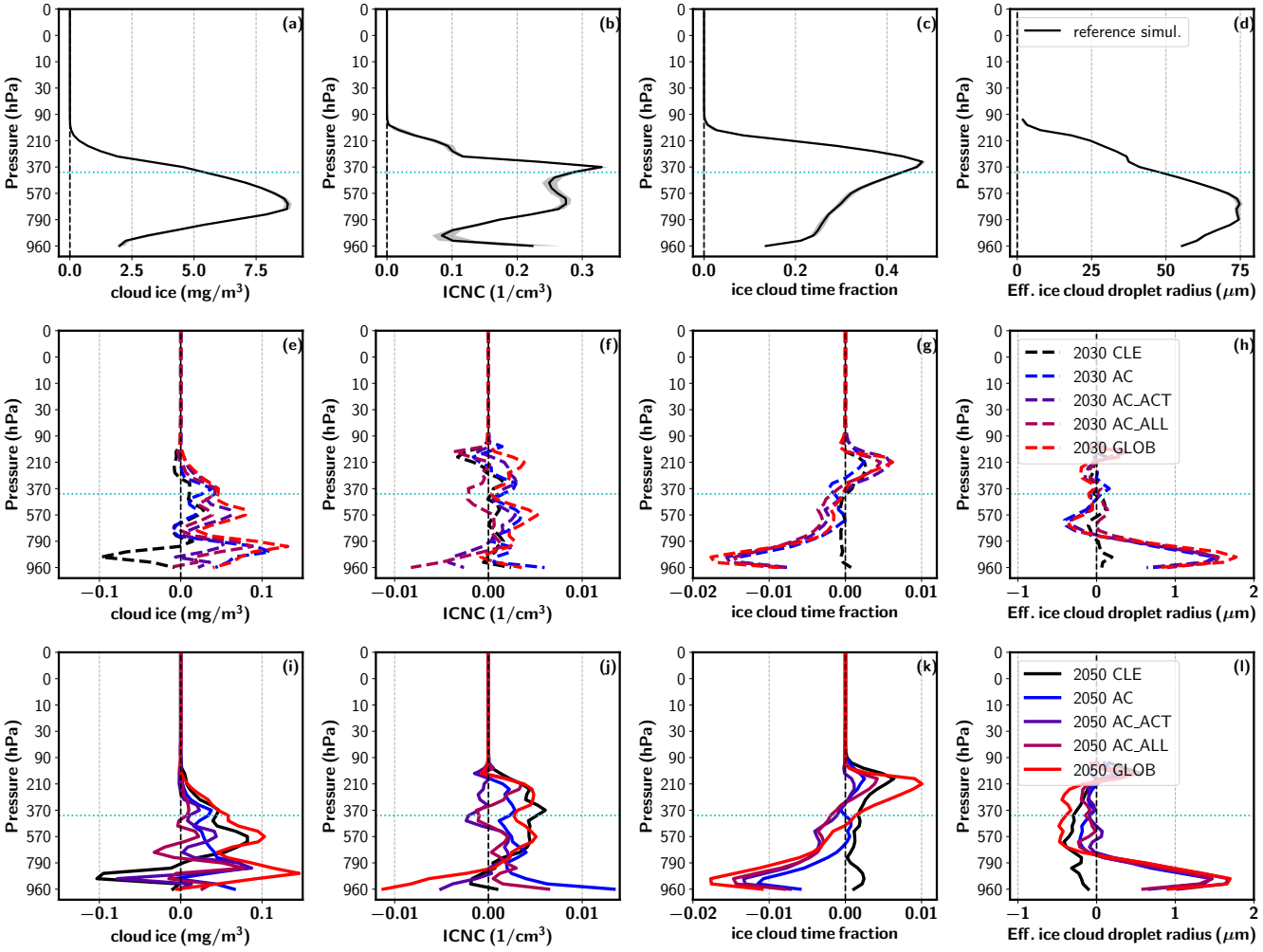

Figure S6. Arctic ice clouds in the simulations. The different columns show cloud ice, IDNC, ice cloud time fraction, and the ice crystal effective radius, respectively. The top row shows the values for 2010, the middle row shows the changes betweed 2010 and 2030, and the bottom row shows the changes between 2010 and 2050. cloud ice, ICNC, and ice crystal effective radius are weighted by the ice cloud time fraction.