bc-no-season: percent difference surface flux of BC – arctic surface flux of SO2 – arctic surface concentration surface concentration of SO4 – arctic surface concentration of SO2 – arctic 0% 0.03% 20% 4% 0.5% Percent 0.02% Percent Percent Percent 10% 2% 0% 0.01% 0% -75% -0.5% 0% 0% -100% 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 Year Year Year Year Year upwelling longwave flux at TOA – arctic upwelling shortwave flux at TOA – arctic upwelling clear-sky longwav flux at TOA - arctic net radiative flux incident shortwave flux at TOA - arctic at TOA - arctic 8e-08% 0.075% 0% 0% 0.08% 6e-08% 0.05% Percent -0.4% -0.4% 0.04% 4e-08% 0.025% -0.8% 0% -0.8% 2e-08% 0% -0.04% 2002 2003 2002 2003 2001 2002 2003 2001 2002 2003 2004 2002 2003 Year Year Year Year Year upwelling clear-sky shortwave clear-sky net radiative dry deposition rate wet deposition rate total deposition rate flux at TOA - arctic flux at TOA - arctic of BC - arctic of BC - arctic of BC - arctic 15% 10% 0% 20% 10% Percent -0.5% Percent Percent -0.5% 0% 10% 5% 0% 0% -1.5% -1.5% -5% -20% 2003 2001 2003 2001 2003 2001 2002 2001 2003 2001 2003 Year Year Year Year Year total deposition rate of S – arctic dry deposition rate wet deposition rate dry deposition rate wet deposition rate of SO2 - arctic of SO2 - arctic of SO4 - arctic of SO4 - arctic 0.6% 0% 4% 0% 0.3% Percent Percent Percent Percent Percent 0% 2% -2% -0.3% -3% 0% 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 Year Year ambient aerosol optical convective cloud cover total cloud cover percentage - arctic percentage - arctic 0.25% 0.3% Percent Percent Percent -40% -0.25% -0.3% -60% 2002 2003 2004 2001 2002 2003 2004 2002 2003 2004 2001 2001 Year Year OsloCTM3 CFSM1 F3SM **GFDI** MIROC

CESM2

GEOS

GISS

NorESM2

UKESM