NH-pacific: absolute difference surface flux of SO2 – bc–no–season surface concentration of BC – bc–no–season surface concentration of SO4 – bc–no–season surface flux of BC – bc–no–season surface concentration of SO2 – bc–no–season 1.2e+00 0.0e+00 4e-01 3e+00 -2e+00 emibc (kg m-2 s-1) emibc (kg m-2 s-1) 9.0e-01 nmrbc (kg kg-1) 2e-01 so2 (kg kg-1) 2e+00 4e+00 mmrso4 (kg 6.0e-01 -5.0e+01 0e+00 -6e+00 3.0e-01 _7 5e+01 -2e-01 0e+00 2003 2002 2003 2003 2003 2001 2002 2003 2001 2002 2001 2001 2002 2002 2001 Year Year Year Year Year upwelling longwave flux at TOA – bc–no–season upwelling shortwave flux at TOA – bc–no–season upwelling clear–sky longwar flux at TOA – bc–no–seaso net radiative flux incident shortwave flux at TOA - bc-no-season at TOA - bc-no-season 4e-01 3e-01 rlut + rsut (W m-2) 0e+00 2e-01 lutcs (W m-2) 0.0e+00 rlut (W m-2) rsut (W m-2) rsdt (W m-2) 2e-01 1e-01 -5e-02 0e+00 0e+00 -1e-01 -2e-01 -5.0e-02 2003 2003 2003 2001 2002 2004 2001 2002 2003 2001 2003 2001 2002 2001 2002 Year Year Year dry deposition rate of BC – bc–no–season upwelling clear-sky shortwa clear-sky net radiative implied cloud response wet deposition rate flux at TOA - bc-no-seaso flux at TOA - bc-no-seasc at TOA - bc-no-season of BC - bc-no-season 2.0e-01 0.0e+00 2e-01 rlut+rsut-rlutcs-rsutcs(W~m/ 1.5e-01 ·lutcs + rsutcs (W m-2) wetbc (kg m-2 s-1) 1e-01 -2.5e+00 drybc (kg m-2 s-' rsutcs (W m-2) 1.0e-01 0e+00 5.0e-02 -5.0e+00 -5.0e+005.0e-02 -1e-01 0.0e+0.00.0e+00 -7.5e+00 -2e-01 -5.0e-02 -5 0e-02 2001 2002 2003 2004 2001 2003 2001 2003 2001 2002 2003 2002 2003 Year Year Year Year Year dry deposition rate of SO2 – bc–no–season dry deposition rate of SO4 – bc–no–season wet deposition rate of SO4 – bc–no–season total deposition rate wet deposition rate of BC - bc-no-season of SO2 - bc-no-season 1e+00 2e-01 3e+00 2e+00 drybc + wetbc (kg m-2 s-1) dryso2 (kg m-2 s-1) wetso4 (kg m-2 s-1) wetso2 (kg m-2 s-1) -8.0e+00 5e-01 dryso4 (kg m-2 2e+00 0e+00 1e+00 -1.2e+01 1e+00 0e+00 -1.6e+01 0e+00 -5e-0° -4e-0 2003 2003 2002 2003 2003 2001 2003 Year Year Year (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3 (kg m-2 s-1) convective cloud cover percentage – bc-no-season total deposition rate ambient aerosol optical total cloud cover of S - bc-no-season percentage – bc-no-seaso 0e+00 2.0e+00 2e-01 1.5e+00 -2e+01 1e-01 1e-01 clt (%) 1.0e+00 -4e+01 0e+00 -6e+01 0.0e+00 -1e-01 -2e-01 2002 2003 2002 2003 Year Year Year Year **UKESM** CESM1 GISS MIROC **GFDI**

CESM2

NorESM2

OsloCTM3

GEOS

E3SM