poster #95

Changes in seasonal high northern latitude CO_2 fluxes from 1986 to 2007

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Rama Nemani, Steve Piper

atmospheric CO_2

inversion fluxes

NDVI

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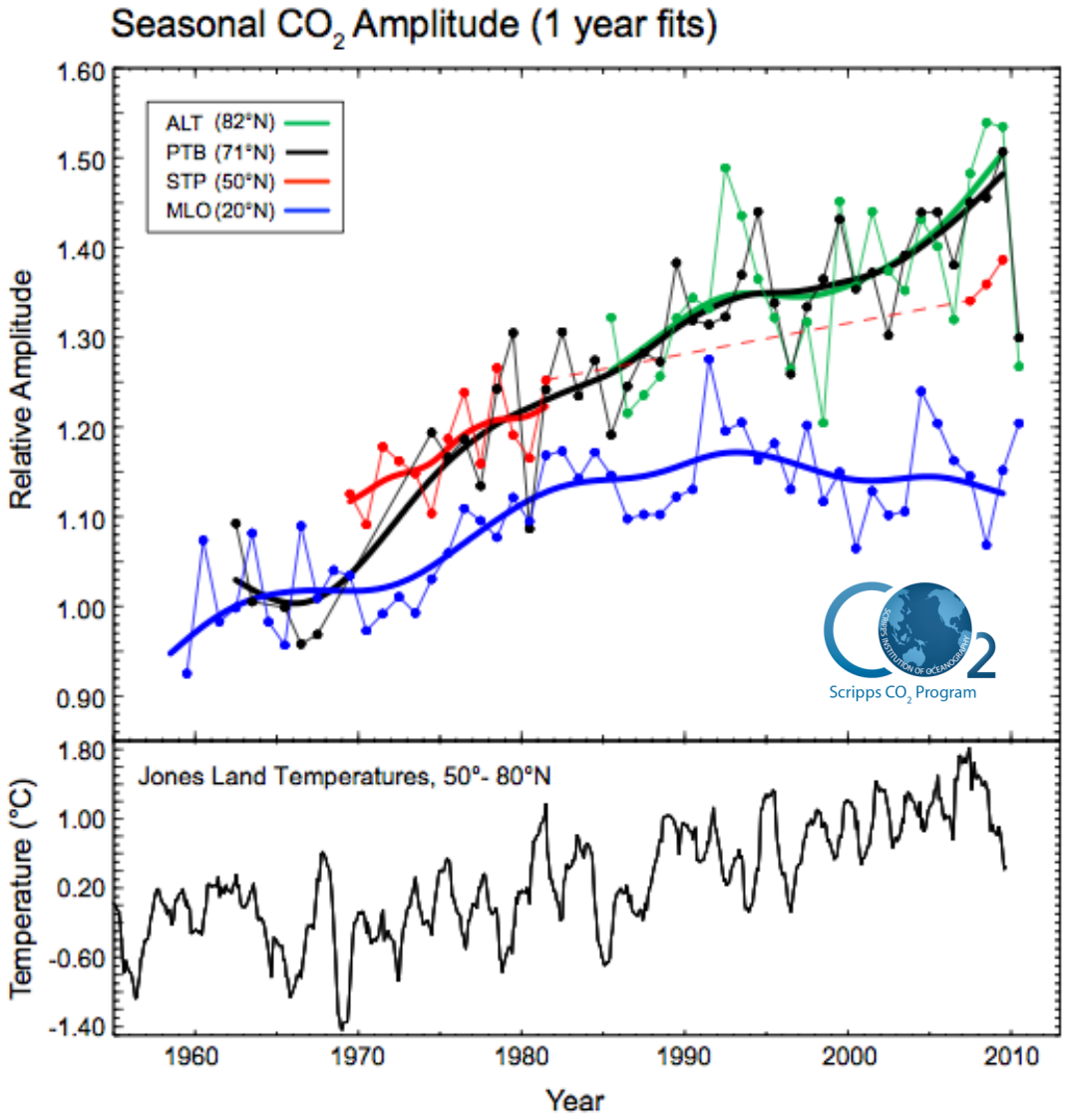
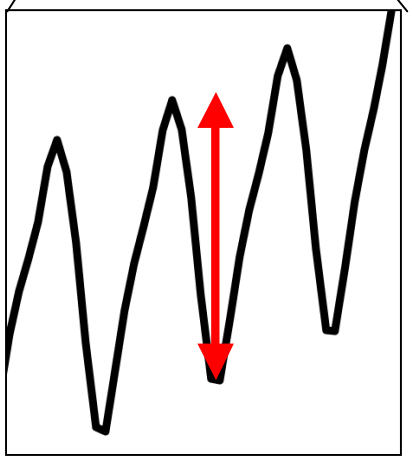
CO_2 seasonal amplitude variability



What has caused these changes in CO_2 amplitude over time?

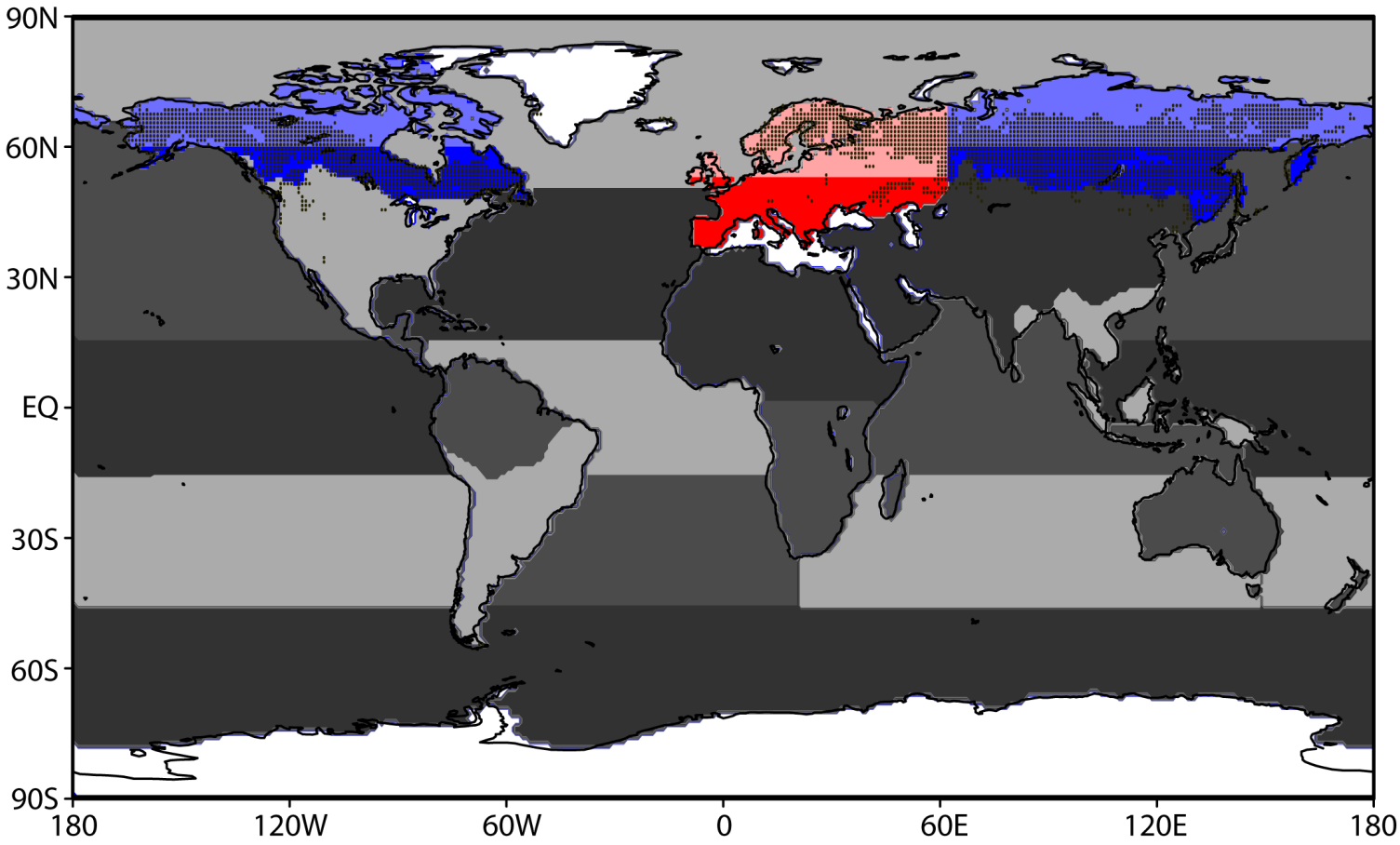
Net CO_2 fluxes from a time dependent inversion

Where? NDVI

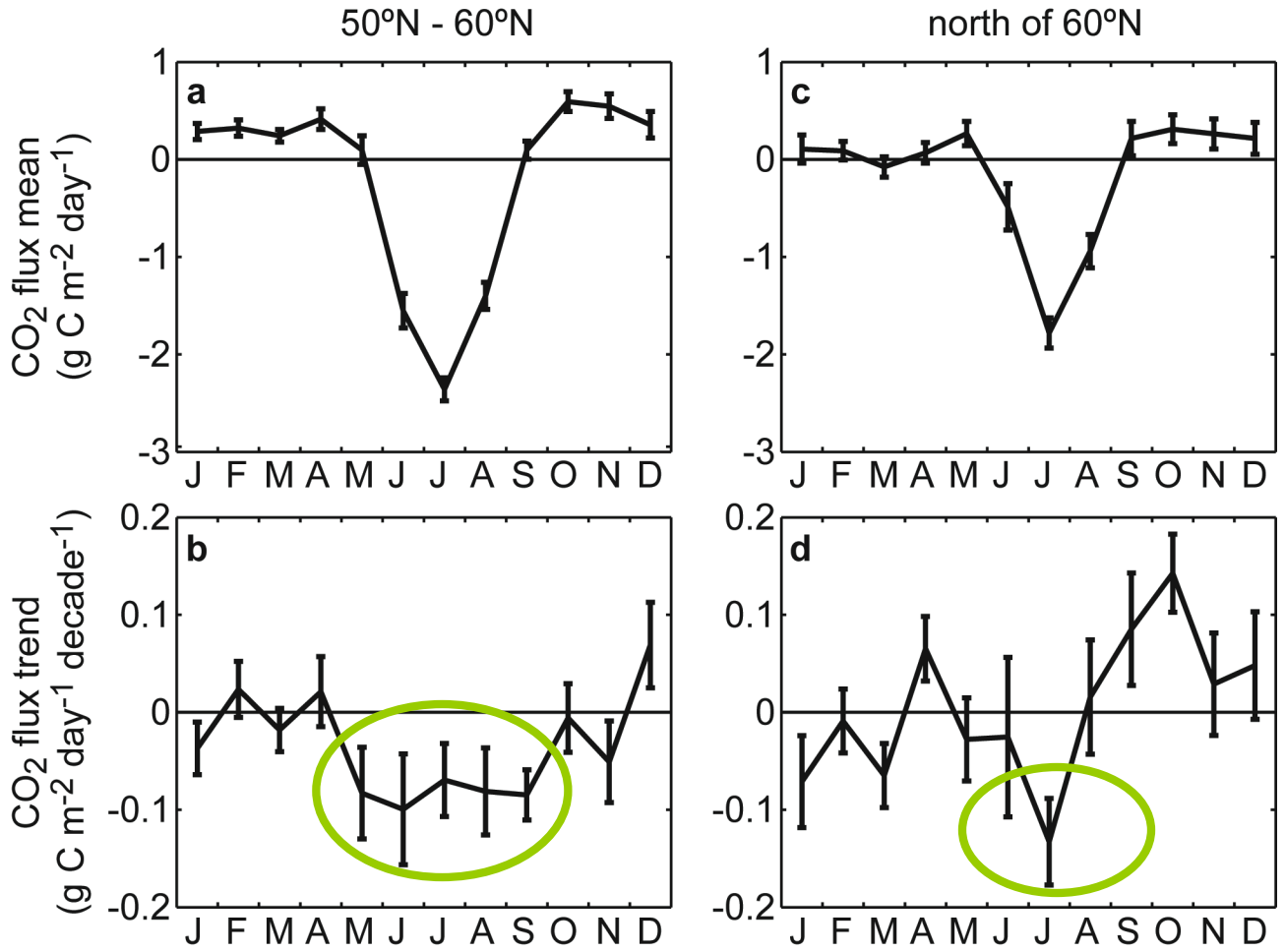


S. Piper *et al.* (*in prep*)

Time dependent inversion of CO_2 fluxes using 26 CO_2 observation stations



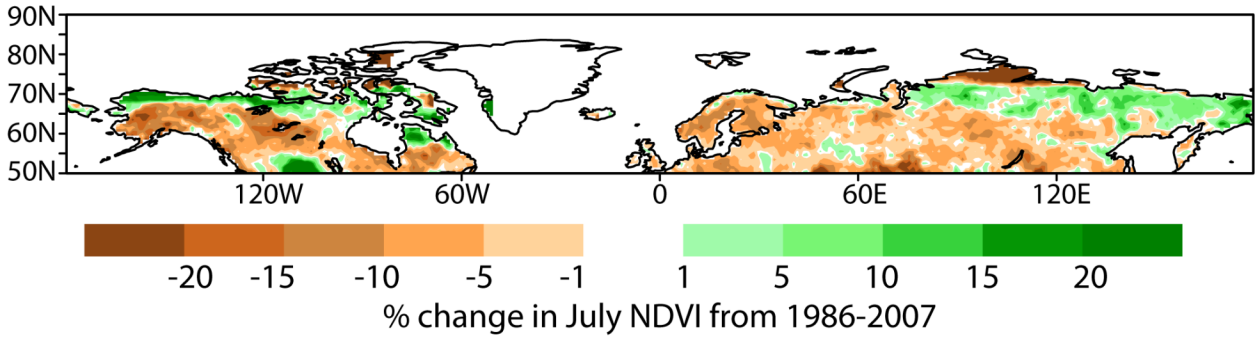
Mean monthly CO_2 fluxes (upper) and trends from 1986 - 2007 (lower)

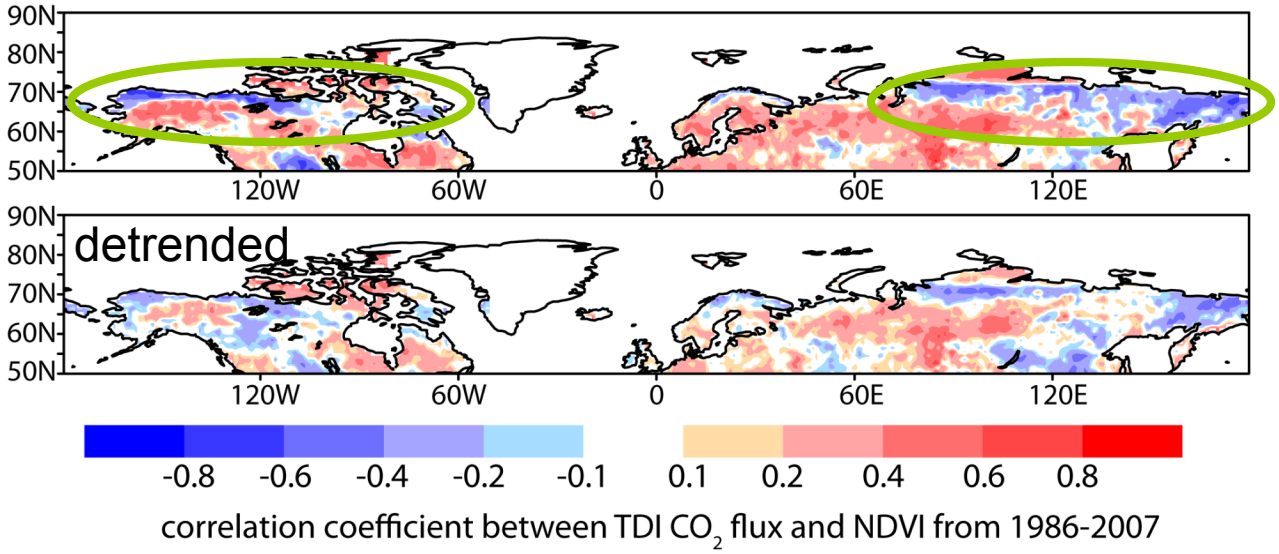


Despite browning trends at 50°N-60°N, growing season uptake has increased.

July uptake north of 60°N was 0.29 g C m^{-2} day^{-1} higher in 2007 than it was in 1986.

NDVI points to increased July uptake in the tundra?





Extra 1.2 g C m^{-2} day^{-1} in the peak of the growing season in the tundra.

Is this possible?

New method for estimating global terrestrial GPP

LETTER

doi:10.1038/nature10421

Interannual variability in the oxygen isotopes of atmospheric CO_2 driven by El Niño

Lisa R. Welp[1], Ralph F. Keeling[1], Harro A. J. Meijer[2], Alane F. Bollenbacher[1], Stephen C. Piper[1], Kei Yoshimura[1]†, Roger J. Francey[3], Colin E. Allison[3] & Martin Wahlen[1]

Welp, L. R. *et al*. *Nature* 477, 579–582 (2011)

120 Pg C yr^{-1} is likely a lower bound and may need to be revised upward to 150 – 175 Pg C yr^{-1}.

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