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Supplement of

Interpreting canopy development and physiology using the EUROPhen camera network at flux sites

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Supplement

Figure S1

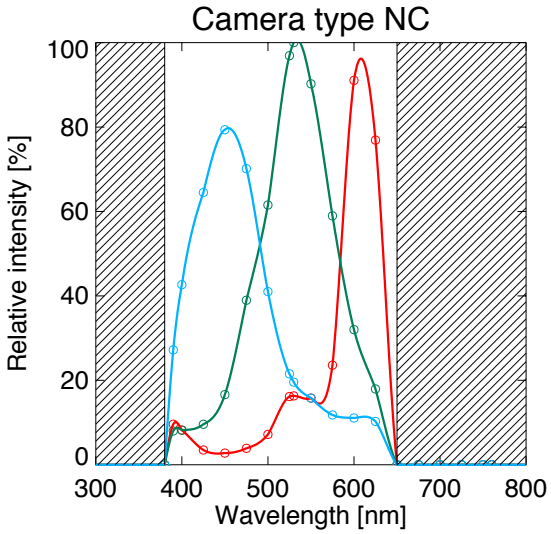

Figure S1. Spectral RGB responses of the NetCam camera sensors, as well as their IR and UV cut-off filters. To ease the comparison with other cameras and because we are only interested in colour fractions the spectral responses have been expressed relative to the maximum value.

Figure S2

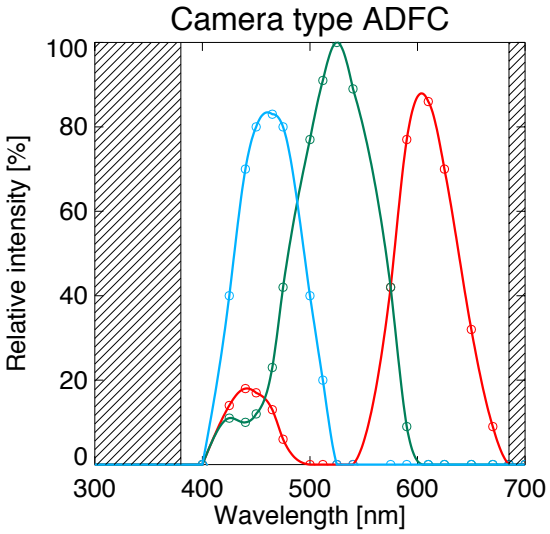

Figure S2. Same as Fig. S1 but for the Nikon Coolpix camera (data courtesy of Dr. T. Nakaji). These data where obtained using a monochrometer (Monochrometer PXE-300, Jasco Co., Tokyo, 1996) coupled to a grating unit in order to emit a beam within the VIS-NIR target wavelengths (400 to 1100 nm with 23 nm FWHM). The intensity of the output beam was then checked with a spectroradiometer (ASD Field Spec PRO) at the beginning of the camera experiment. Thereafter, images of the diffused beam directed on to a Spectralon card were captured by a range of commercial cameras. Images were captured whilst varying the wavebands (20 bands) from 408 to 782 nm. The experiment was conducted in a dark room, and the geometry and camera settings (white balance, shutter speed, etc.) were adjusted. The DN of image RGB pixels were then corrected for dark noise and the ratio between DN and input energy was calculated and expressed as a relative value to estimate the camera sensitivity differences.

Figure S3

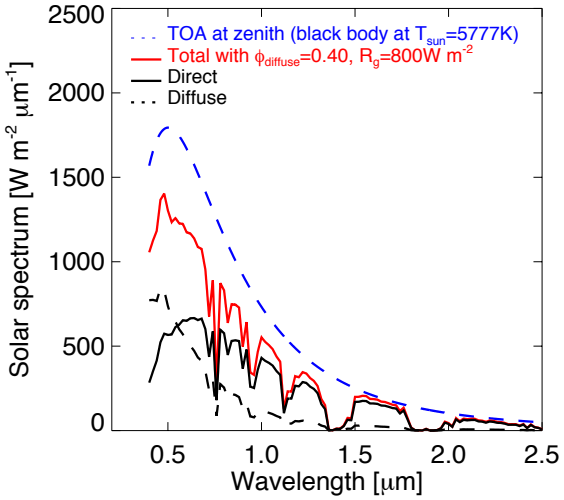

Figure S3. Solar spectra for top-of-the-atmosphere (TOA), and top-of-the-canopy (TOC) incoming radiation, assuming 40% diffuse radiation. The TOA spectra is computed for a black body at 5777K while the TOC spectra is computed from pure direct and diffuse spectra calculated using the 6S radiative transfer model (François *et al.*, 1999) also shown in the figure.

Figure S4

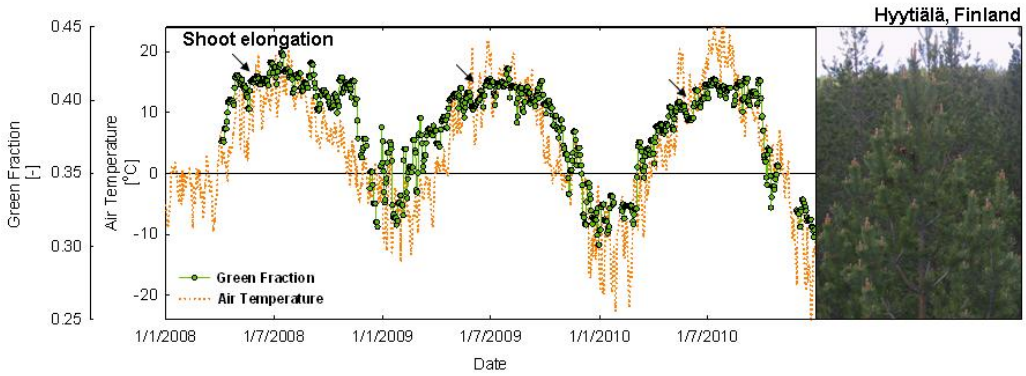

Figure S4. Green fraction and daily air temperature time-series at the evergreen conifer forest Hyytiälä. Arrows indicate periods when new shoots elongate and a typical image during this phenological event is also shown for illustration.

Figure S5

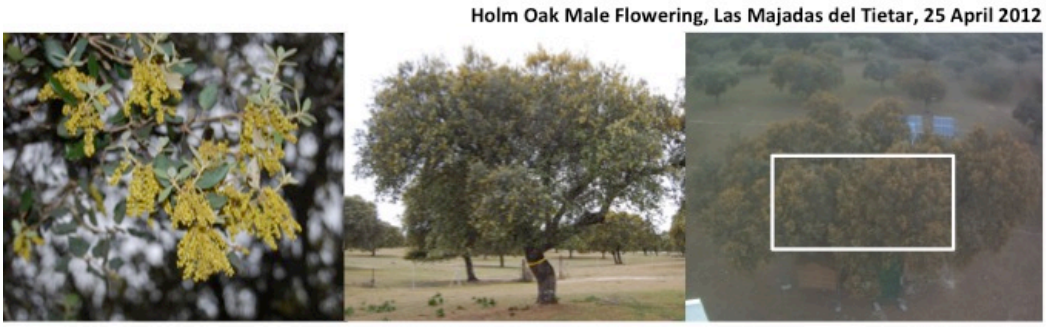

Figure S5. Digital photographs that illustrate the male flowering at the Las Majadas del Tietar evergreen broadleaf forest during April 2012.

Figure S6

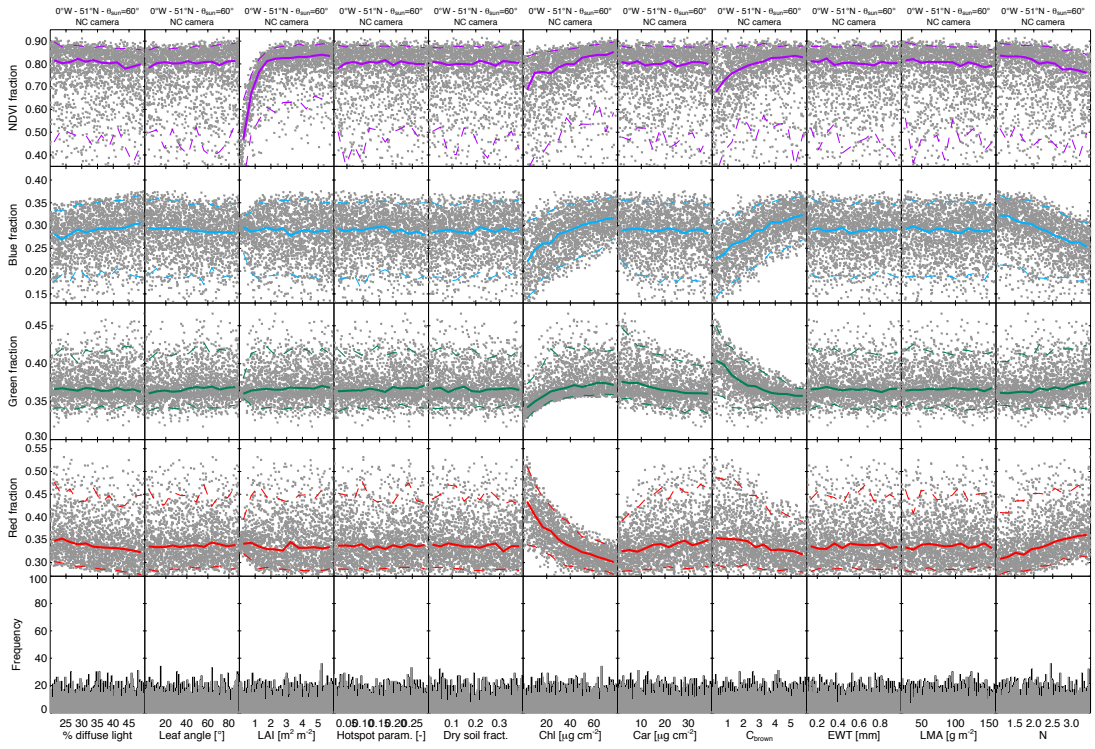

Figure S6. Sensitivity of modelled RGB fractions and NDVI for the NetCam camera at the Alice Holt deciduous broadleaf forest site, as predicted by the PROSAIL model and assuming no correlation between model parameters, and a constant solar elevation of 60°. The NDVI is computed using the camera view angle and the same wavebands as for MODIS NDVI (545-565 nm for red and 841-871 nm for near infrared).

Figure S7

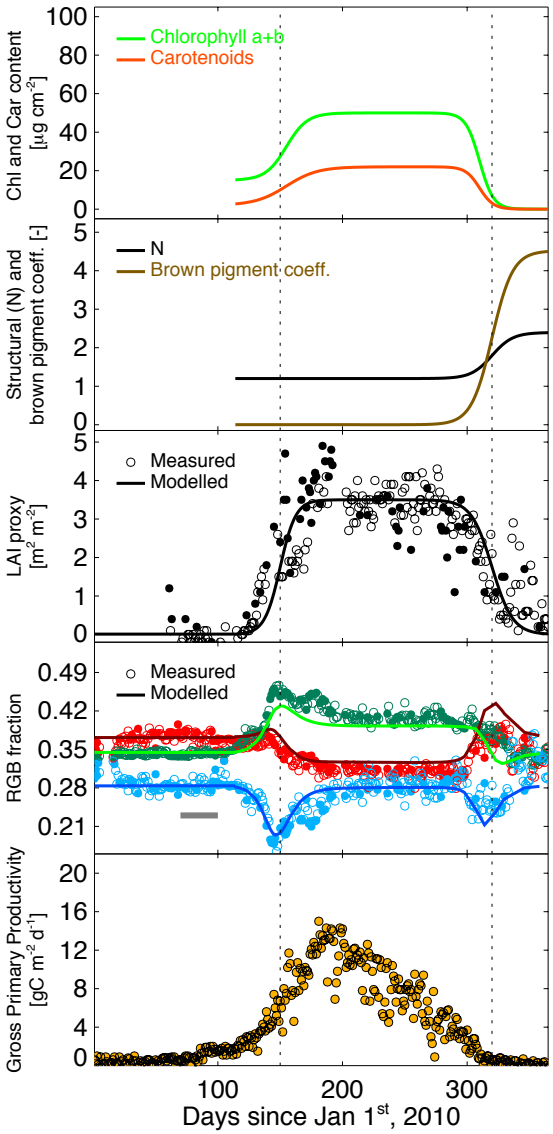

Figure S7. As in Fig. 12, but for the Nikon Coolpix camera (i.e. using the camera spectral response from Fig. S2, rather than from Fig. S1).