Plant water potential improves prediction of empirical stomatal models

S1 File: Supplemental Tables and Table Legends

Table A: Species included in the analysis with their biome (needleleaf evergreen temperate (NET), broadleaf evergreen temperate (BET), broadleaf deciduous temperate (BDT), tropical deciduous (TPD), and tropical evergreen (TPE), sample size (N), and the reference study.

Species name	N	Biome	Reference
Acer campestre	41	BDT	(Li *et al.*, 2016)
Acer pseudoplatanus	39	BDT	(Li *et al.*, 2016)
Alphitonia excelsa	173	TPE	(Choat *et al.*, 2006)
Anacardium excelsum	14	TPD	(Meinzer *et al.*, 2004)
Annona hayesii	46	TPD	(Wolfe *et al.*, 2016)
Astronium graveolens	338	TPE	(Wolfe *et al.*, 2016)
Austromyrtus bidwillii	35	TPE	(Choat *et al.*, 2006)
Brachychiton australis	100	TPD	(Choat *et al.*, 2006)
Bursera simaruba	104	TPD	(Wolfe *et al.*, 2016)
Carpinus betulus	48	BDT	(Li *et al.*, 2016)
Cavanillesia platanifolia	41	TPD	(Wolfe *et al.*, 2016)
Cochlospermum gillivraei	75	TPD	(Choat *et al.*, 2006)
Cojoba rufescens	319	TPE	(Wolfe *et al.*, 2016)
Cordia alliodora	18	TPD	(Meinzer *et al.*, 2004)
Corylus avellana	35	BDT	(Li *et al.*, 2016)
Eucalyptus globulus	73	BET	Hernandez et al. 2016
Ficus insipida	14	TPE	(Meinzer *et al.*, 2004)
Fraxinus excelsior	40	BDT	(Li *et al.*, 2016)
Genipa americana	109	TPD	(Wolfe *et al.*, 2016)
Juniperus monosperma	576	NET	(LIMOUSIN *et al.*, 2013)
Juniperus osteosperma	34	NET	(Koepke & Kolb, 2013)
Phillyrea angustifolia	17	BET	(Resco *et al.*, 2009)
Picea abies	544	NET	(Chmura *et al.*, 2016)
Pinus edulis	511	NET	(LIMOUSIN *et al.*, 2013)
Pinus ponderosa	146	NET	(Koepke & Kolb, 2013)
Pistacia lentiscus	23	BET	(Resco *et al.*, 2009)
Populus balsamifora	29	BDT	(Arango-Velez *et al.*, 2011)

Populus tremuloides	43	BDT	(Anderegg, 2012)
Prosopis velutina	23	BDT	(Lin *et al.*, 2015)
Quercus douglasii	166	BET	(Xu & Baldocchi, 2003)
Quercus gambelii	12	BDT	(Koepke & Kolb, 2013)
Quercus ilex	110	BET	(Martin-StPaul *et al.*, 2012)
Schefflera morototoni	19	TPE	(Meinzer *et al.*, 2004)
Tapirira guianensis	33	TPE	(Meinzer *et al.*, 2004)

Supplemental Figures and Figure Legends

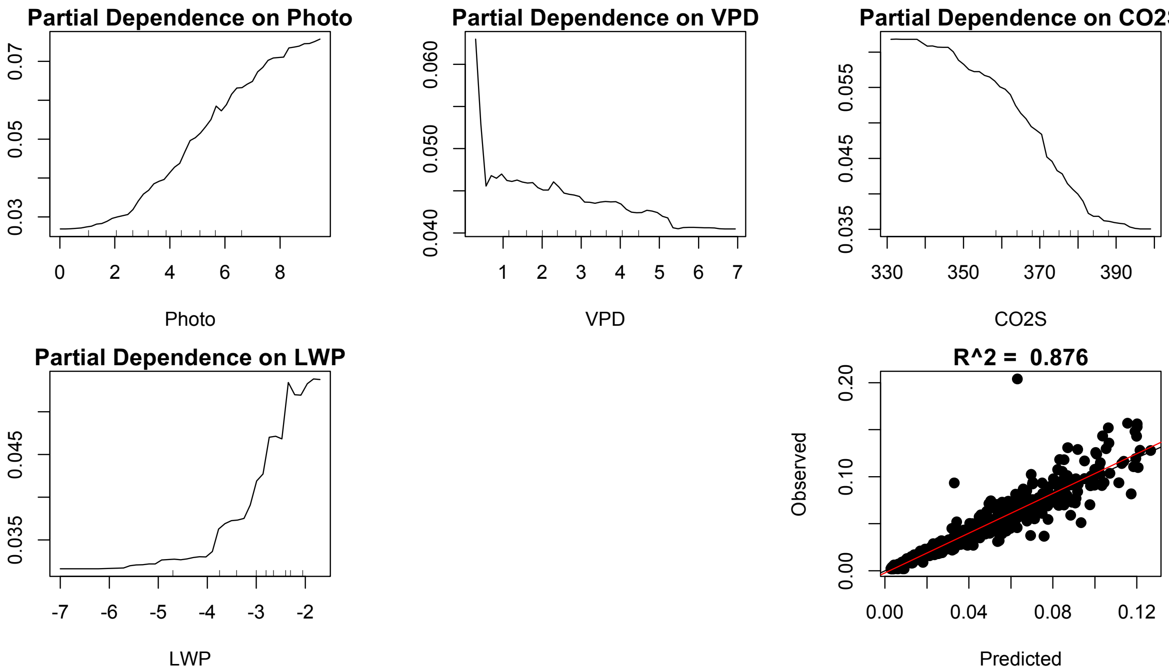

Figure A: Partial dependencies of stomatal conductance (note that Y-axes are unitless because they are model-dependent) on photosynthesis (Photo; umol*m^{-2}*s^{-1}), vapor pressure deficit (VPD; kPa), CO_2 concentration (CO2S; ppm) and leaf water potential (LWP; MPa) from the RandomForest model for *Juniperus monosperma* as an example species. Lower right indicates the predicted versus observed plot of stomatal conductance when comparing to out-of-bag predictions – R^2 of 0.876.

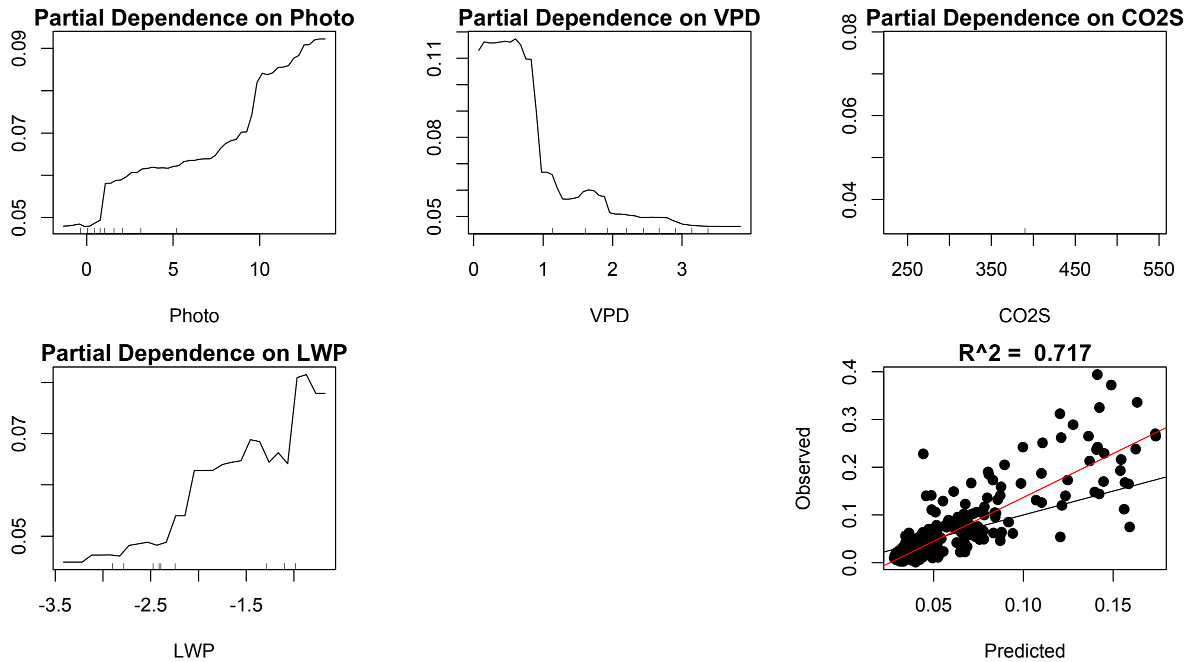

Figure B: Partial dependencies of stomatal conductance (note that Y-axes are unitless because they are model-dependent) on photosynthesis (Photo; umol*m^{-2}*s^{-1}), vapor pressure deficit (VPD; kPa), CO_2 concentration (CO2S; ppm) and leaf water potential (LWP; MPa) from the RandomForest model for *Astronium graveolens* as an example species (note this species experienced no variation in CO_2 concentration). Lower right indicates the predicted versus observed plot of stomatal conductance when comparing to out-of-bag predictions – R^2 of 0.717.

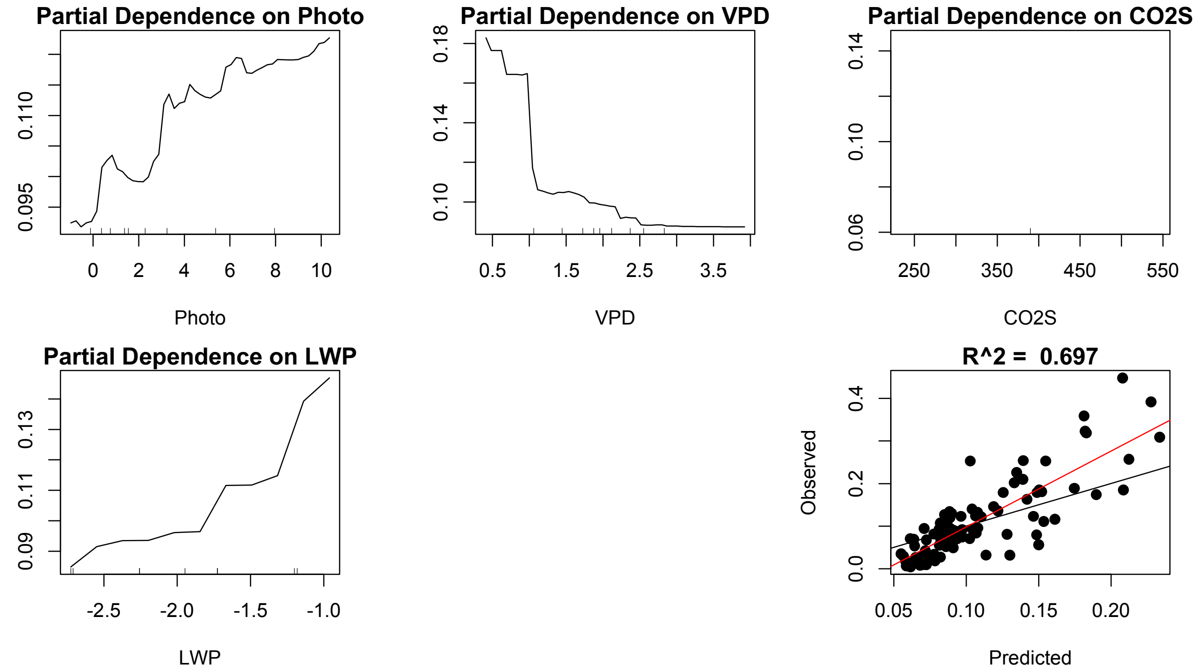

Figure C: Partial dependencies of stomatal conductance (note that Y-axes are unitless because they are model-dependent) on photosynthesis (Photo; umol*m^{-2}*s^{-1}), vapor pressure deficit (VPD; kPa), CO_2 concentration (CO2S; ppm) and leaf water potential (LWP; MPa) from the RandomForest model for *Genipa americana* as an example species (note this species experienced no variation in CO_2 concentration). Lower right indicates the predicted versus observed plot of stomatal conductance when comparing to out-of-bag predictions – R^2 of 0.697.

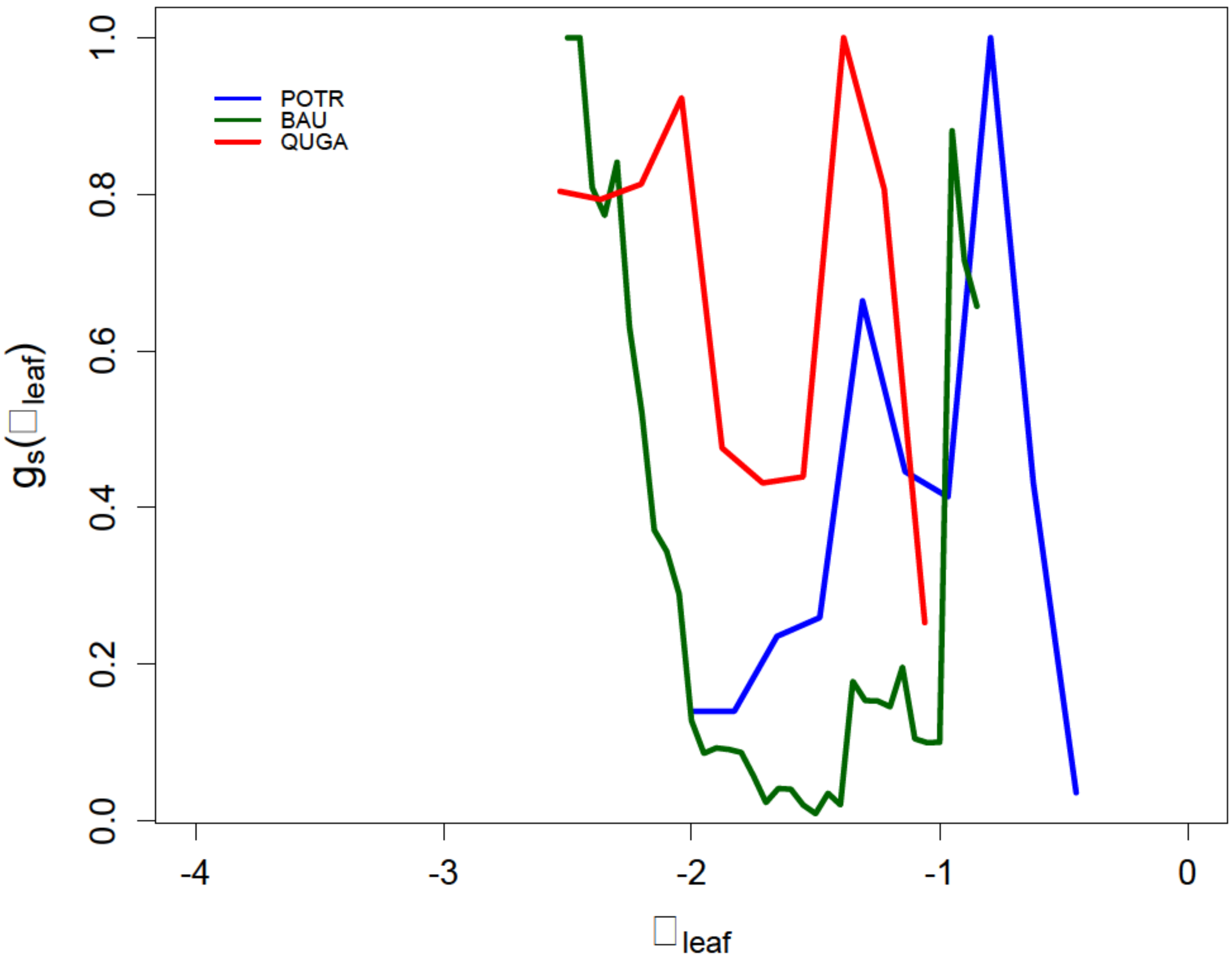

Figure D: Partial dependency of stomatal conductance on leaf water potential for three species in which the functional form was uninterpretable. Species are: *Populus tremuloides* (POTR), *Brachychiton australis* (BAU), and *Quercus gambelii* (QUGA).

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