

Supplementary Materials

Table S1. Site characteristics of the PhenoCam Network and Phenology Eye Network sites used in this study. Vegetation types are as follows: DB = deciduous broadleaf; DN = deciduous needleleaf; GR = grassland; MX = mixed vegetation; SH = shrubs; TN = tundra; WL = wetland.

Camera Name	Full Site Name	Latitude (°)	Longitude (°)	Elevation (m)	Vegetation Type
acadia	Acadia National Park, McFarland Hill, near Bar Harbor, Maine	44.377	-68.261	158	DB
ahwahnee	Ahwahnee Meadow, Yosemite National Park, California	37.747	-119.582	1199	GR
alligatorriver	Alligator River National Wildlife Refuge, North Carolina	35.788	-75.904	1	DB
arbutuslakeinlet	Arbutus Lake Inlet Tower, Huntington Wildlife Forest, Newcomb, New York	43.993	-74.245	527	DB
ashburnham	Ashburnham State Forest / Overlook Middle School, Ashburnham, Massachusetts	42.603	-71.926	292	DB
asuhighlands	Appalachian State University, Boone, NC	36.208	-81.703	1016	DB
bartlettir	Bartlett Experimental Forest, Bartlett, New Hampshire	44.065	-71.288	268	DB
bbc1	Hardwood Walk-up Tower, Harvard Forest, Petersham, Massachusetts	42.535	-72.174	362	DB
bbc2	LPH Tower, Harvard Forest, Petersham, Massachusetts	42.542	-72.185	380	DB
bbc7	Bartlett Experimental Forest, Bartlett, New Hampshire	44.065	-71.288	289	DB
bitterrootvalley	Bitterroot Valley, Stephenville, Montana	46.507	-114.091	1017	DB
boundarywaters	Boundary Waters Canoe Area Wilderness, Superior National Forest, Minnesota	47.947	-91.496	519	DB

butte	Continental Divide, Butte, Montana	45.953	-112.480	1682	GR
caryinstitute	Cary Institute of Ecosystem Studies, Millbrook, NY	41.784	-73.734	127	DB
coweeta	Coweeta Hydrologic Laboratory, USDA Forest Service, Southern Research Station, Otto, North Carolina	35.059	-83.428	680	DB
cperagm	CPER Adaptive Grazing Management	40.840	-104.767	1644	GR
downerwoods	UW-Milwaukee Field Station, Downer Woods Natural Area, Milwaukee, Wisconsin	43.079	-87.881	213	DB
dukehw	Hardwood Stand, Duke Forest, North Carolina	35.974	-79.100	400	DB
grandteton	Grand Teton National Park, Wyoming	43.915	-110.578	2054	SH
greenridge1	Green Ridge State Forest, Maryland USA	39.691	-78.407	285	DB
harvard	EMS Tower, Harvard Forest, Petersham, Massachusetts	42.538	-72.172	340	DB
harvardbarn	Barn Tower, Camera 1, Harvard Forest, Petersham, Massachusetts	42.535	-72.190	350	DB
harvardblo	Below-canopy camera, EMS Tower, Harvard Forest, Petersham, Massachusetts	42.538	-72.172	340	DB
harvardhemlock	Hemlock Tower, Harvard Forest, Petersham, Massachusetts	42.539	-72.180	355	DB
harvardlph	LPH Tower, Harvard Forest, Petersham, Massachusetts	42.542	-72.185	380	DB
hubbardbrooksfws	South Facing Watersheds, Hubbard Brook Experimental Forest, Thornton, New Hampshire	43.927	-71.741	650	DB

imcrkridge0	Imnavait Creek Ridge, camera-0, AON IC_1991, Alaska	68.607	-149.296	951	TN
imcrkridge1	Imnavait Creek Ridge, camera-1, AON IC_1991, Alaska	68.607	-149.296	951	TN
innsbruck	Neustift Field Site, Stubai Valley, Tyrol, Austria	47.116	11.320	972	GR
joycekilmer	Joyce Kilmer Slickrock Wilderness, North Carolina	35.257	-83.795	1373	DB
juncabalejo	Middle of Doñana marshes, Spain	36.936	-6.378	1	WL
kansas	KU Field Station, University of Kansas, Kansas	39.056	-95.191	333	GR
konza	Konza Prairie Biological Station, Kansas State University, Kansas	39.082	-96.560	443	GR
lacclair	Lac Clair, Quebec, Canada	46.952	-71.670	313	DB
lethbridge	Lethbridge Grassland Ecosystem Site, Lethbridge, Alberta	49.709	-112.940	950	GR
lostcreek	Lost Creek, Wisconsin	46.083	-89.979	480	WL
macleish	Canopy forest, MacLeish Field Station, Whately, Massachusetts	42.448	-72.680	251	DB
mammothcave	Environmental Learning Center, Mammoth Cave National Park, Kentucky	37.186	-86.102	226	DB
marcell	Marcell Experimental Forest, Minnesota	47.514	-93.469	422	DB
montebondone grass	Monte Bondone grassland FLUXNET site, Monte Bondone, Italy	46.015	11.046	1550	GR
montebondone peat	Monte Bondone peatland site, Monte Bondone, Italy	46.018	11.041	1563	WL
morganmonroe	Morgan Monroe State Forest, Indiana	39.323	-86.413	275	DB
morganmonroe 2	Morgan Monroe State Forest, Indiana	39.323	-86.413	275	DB

nationalcapital	Park Police Headquarters, National Capital Parks, Washington DC	38.888	-77.069	28	DB
nationalelkre fuge	National Elk Refuge, Wyoming	43.489	-110.738	1899	GR
ncssm	North Carolina School of Science and Mathematics, Durham, North Carolina	36.018	-78.921	175	DB
NEON.D01.H ARV.DP1.0003 3	NEON Site - D01 (Northeast) Harvard Forest, Massachusetts - tower top	42.537	-72.173	359	DB
NEON.D01.H ARV.DP1.0004 2	NEON Site - D01 (Northeast) Harvard Forest, Massachusetts - mid-tower	42.537	-72.173	359	DB
NEON.D02.BL AN.DP1.00033	NEON Site - D02 (Mid- Atlantic) Blandy Experimental Farm, Virginia - tower top	39.034	-78.042	162	DB
NEON.D02.SC BL.DP1.00033	NEON Site - D02 (Mid- Atlantic) Smithsonian Conservation Biology Institute, Virginia - tower top	38.893	-78.139	364	DB
NEON.D03.JE RC.DP1.00033	NEON Site - D03 (Southeast) Jones Ecological Research Center, Georgia - tower top	31.195	-84.469	58	DB
NEON.D03.JE RC.DP1.00042	NEON Site - D03 (Southeast) Jones Ecological Research Center, Georgia - mid-tower	31.195	-84.469	58	DB
NEON.D05.TR EE.DP1.00033	NEON Site - D05 (Great Lakes) Treehaven, Wisconsin - tower top	45.494	-89.586	474	DB
NEON.D05.TR EE.DP1.00042	NEON Site - D05 (Great Lakes) Treehaven, Wisconsin - mid-tower	45.494	-89.586	474	DB
NEON.D05.U NDE.DP1.0003 3	NEON Site - D05 (Great Lakes) UNDERC, Michigan - tower top	46.234	-89.537	529	DB

NEON.D06.KI NG.DP1.20002	NEON Site - D06 (Prairie Peninsula) Kings Creek, Kansas - aquatic/stream-gauge camera	39.105	-96.603	339	WL
NEON.D06.K ONZ.DP1.0003 3	NEON Site - D06 (Prairie Peninsula) Konza Prairie Biological Station, Kansas - top-of-tower camera	39.101	-96.563	415	GR
NEON.D06.K ONZ.DP1.0004 2	NEON Site - D06 (Prairie Peninsula) Konza Prairie Biological Station, Kansas - mid-tower camera	39.101	-96.563	415	GR
NEON.D07.GR SM.DP1.00033	NEON Site - D07 (Appalachians and Cumberland Plateau) Great Smoky Mountains National Park, Tennessee - tower top	35.689	-83.502	589	DB
NEON.D07.GR SM.DP1.00042	NEON Site - D07 (Appalachians and Cumberland Plateau) Great Smoky Mountains National Park, Tennessee - mid-tower	35.689	-83.502	589	DN
NEON.D07.M LBS.DP1.0003 3	NEON Site - D07 (Appalachians and Cumberland Plateau) Mountain Lake Biological Station, Virginia - tower top	37.378	-80.525	1177	DB
NEON.D07.OR NL.DP1.00033	NEON Site - D07 (Appalachians and Cumberland Plateau) Oak Ridge, Tennessee - tower top	35.964	-84.283	351	DB
NEON.D07.OR NL.DP1.00042	NEON Site - D07 (Appalachians and Cumberland Plateau) Oak Ridge, Tennessee - mid-tower	35.964	-84.283	351	DB
NEON.D07.W ALK.DP1.2000 2	NEON Site - D07 (Appalachians &	35.959	-84.280	274	WL

	Cumberland Plateau) Walker Ranch, TN				
NEON.D08.DE LA.DP1.00033	NEON Site - D08 (Ozarks Complex) Dead Lake, Alabama - tower top	32.542	-87.804	36	DB
NEON.D08.LE NO.DP1.00033	NEON Site - D08 (Ozarks Complex) Lenoir Landing, AL - top of tower	31.854	-88.161	10	DB
NEON.D09.DC FS.DP1.00033	NEON Site - D09 (Northern Plains) Dakota Coteau Field School, North Dakota - top-of-tower camera	47.162	-99.107	574	GR
NEON.D09.DC FS.DP1.00042	NEON Site - D09 (Northern Plains) Dakota Coteau Field School, North Dakota - mid-tower camera	47.162	-99.107	574	GR
NEON.D09.N OGP.DP1.0003 3	NEON Site - D09 (Northern Plains) Northern Great Plains Research Laboratory, North Dakota - top-of-tower camera	46.770	-100.915	589	GR
NEON.D09.N OGP.DP1.0004 2	NEON Site - D09 (Northern Plains) Northern Great Plains Research Laboratory, North Dakota - mid-tower camera	46.770	-100.915	589	GR
NEON.D09.PR PO.DP1.20002	NEON Site - D09 (Northern Plains) Prairie Pothole, North Dakota -	47.130	-99.251	587	WL
NEON.D09.W OOD.DP1.000 33	NEON Site - D09 (Northern Plains) Woodworth, North Dakota - tower top	47.128	-99.241	585	GR
NEON.D10.AR IK.DP1.20002	NEON Site - D10 (Central Plains) Arikaree River Colorado	39.758	-102.447	1188	GR
NEON.D10.CP ER.DP1.00033	NEON Site - D10 (Central Plains) Central Plains Experimental Range, Nunn, CO top	40.816	-104.746	1600	GR

NEON.D11.CL BJ.DP1.00033	NEON Site - D11 (Southern Plains) LBJ National Grassland, Texas - tower top	33.401	-97.570	279	DB
NEON.D11.O AES.DP1.0003 3	NEON Site - D11 (Southern Plains) Klemme Range Research Station, Oklahoma - top-of-tower camera	35.411	-99.059	520	GR
NEON.D13.NI WO.DP1.0003 3	NEON Site - D13 (Southern Rockies and Colorado Plateau) Niwot Ridge Mountain Research Station, Colorado - tower top	40.054	-105.582	3493	TN
NEON.D13.NI WO.DP1.0004 2	NEON Site - D13 (Southern Rockies and Colorado Plateau) Niwot Ridge Mountain Research Station, Colorado - mid-tower	40.054	-105.582	3493	TN
NEON.D18.TO OL.DP1.00033	NEON Site - D18 (Tundra) Toolik, Alaska - tower top	68.661	-149.370	827	TN
NEON.D18.TO OL.DP1.00042	NEON Site - D18 (Tundra) Toolik, Alaska - mid-tower	68.661	-149.370	827	TN
northattleboro ma	North Attleboro High School, North Attleboro, Massachusetts	41.984	-71.311	60	DB
oakville	Oakville Prairie, North Dakota	47.899	-97.316	268	GR
proctor	University of Vermont, Proctor Maple Research Center, Underhill, Vermont	44.525	-72.866	403	DB
queens	Queen's University Biological Station, Lake Opinicon, Ontario, Canada	44.565	-76.324	126	DB
readingma	Austin Prep School, Reading, Massachusetts	42.530	-71.127	100	DB
robinson	Fire Tower, Robinson Forest, Kentucky	37.467	-83.158	483	DB
robinson2	Fire Tower (Facing West), Robinson Forest, Kentucky	37.467	-83.158	483	DB

russellsage	Russell Sage State Wildlife Management Area, near Monroe, Louisiana	32.457	-91.974	20	DB
sanford	Sanford Natural Area, Michigan State University, East Lansing, Michigan	42.727	-84.464	268	DB
shiningrock	Shining Rock Wilderness, Blue Ridge Parkway National Park, North Carolina	35.390	-82.775	1500	DB
smokylook	Look Rock, Great Smoky National Park, Tennessee	35.633	-83.943	801	DB
springfieldma	Academy Hill School, Springfield, Massachusetts	42.135	-72.586	56	DB
spruceA0EMT	SPRUCE EM Transect, Marcell Experimental Forest, Grand Rapids, Minnesota, USA	47.505	-93.454	418	SH
spruceA0P07S H	SPRUCE Experiment, Control plot 7, Marcell Experimental Forest, Minnesota, USA	47.505	-93.453	413	SH
spruceA0P21S H	SPRUCE Experiment, Control plot 21, Marcell Experimental Forest, Minnesota, USA	47.506	-93.453	413	SH
spruceT0P06S H	Marcell Experimental Forest, north of Grand Rapids, Minnesota, USA	47.505	-93.454	410	SH
spruceT0P19E SH	Marcell Experimental Forest, north of Grand Rapids, Minnesota, USA	47.507	-93.454	410	SH
spruceT2P11E SH	Marcell Experimental Forest, north of Grand Rapids, Minnesota, USA	47.505	-93.453	410	SH
spruceT2P20S H	Marcell Experimental Forest, north of Grand Rapids, Minnesota, USA	47.506	-93.453	410	SH

spruceT4P04E SH	Marcell Experimental Forest, north of Grand Rapids, Minnesota, USA	47.505	-93.454	410	SH
spruceT4P13S H	Marcell Experimental Forest, north of Grand Rapids, Minnesota, USA	47.506	-93.453	410	SH
spruceT6P08S H	Marcell Experimental Forest, north of Grand Rapids, Minnesota, USA	47.506	-93.454	410	SH
spruceT6P16E SH	Marcell Experimental Forest, north of Grand Rapids, Minnesota, USA	47.506	-93.453	410	SH
spruceT9P10E SH	Marcell Experimental Forest, north of Grand Rapids, Minnesota, USA	47.505	-93.453	410	SH
spruceT9P17S H	Marcell Experimental Forest, north of Grand Rapids, Minnesota, USA	47.506	-93.453	410	SH
stjones	St. Jones Estuarine Research Reserve, Dover, Delaware	39.088	-75.437	2	GR
sylvania	Sylvania Wilderness, Wisconsin	46.242	-89.348	540	DB
teddy	Painted Canyon Visitor Center, Teddy Roosevelt National Park, North Dakota	46.895	-103.378	853	GR
torgnon-nd	Torgnon Research Site (Alpine grassland site), Torgnon, Italy	45.844	7.578	2160	GR
torrepalacio	Doñana marshes from the survey tower located at El Palacio	36.991	-6.443	3	WL
turkeypointdbf	Mature Deciduous Site, Turkey Point Carbon Cycle Research Project, Ontario, Canada	42.635	-80.558	211	DB
uiefprairie	Restored prairie at the University of Illinois Energy Farm, Urbana, IL USA	40.065	-88.198	224	GR

umichbiologica 12	FASET Tower, University of Michigan Biological Station, near Pellston, Michigan	45.563	-84.698	240	DB
willowcreek	Willow Creek, Chequamegon-Nicolet National Forest, Wisconsin	45.806	-90.079	521	DB
worcester	Worcester State University, Worcester, Massachusetts	42.270	-71.843	185	DB

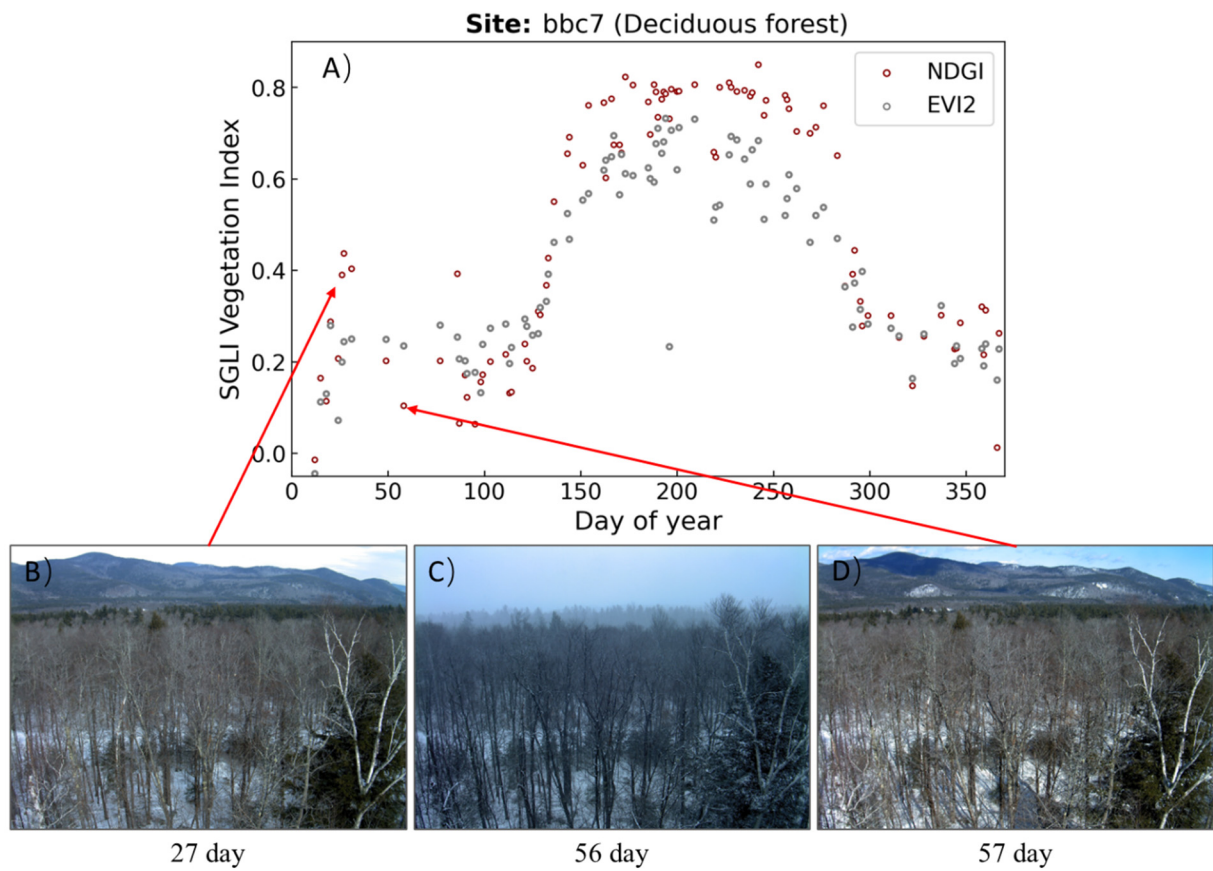


Figure S1. Comparison of NDGI and EVI2 time series retrieved from SGLI (A). B, C, and D are digital images from the PhenoCam Network site weather cameras corresponding to surface conditions at 27 days, 56 days, and 57 days, respectively.

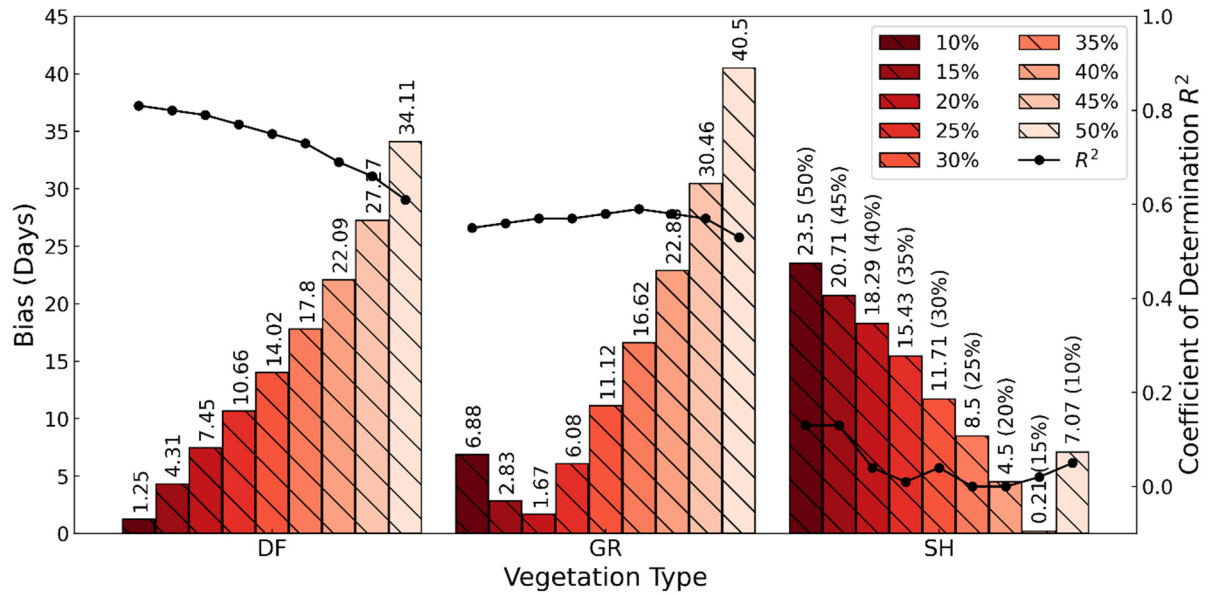


Figure S2. Bias and coefficient of determination between dormancy dates derived from SGLI and near-surface observation. Results are separated according to vegetation type (DF: deciduous forest; GR: grassland, SH: shrub). Progressively darker shades of red are used to designate dormancy dates corresponding to different thresholds (10% to 50% of threshold by 5% step).