Supplementary Materials:

Table S1. Traditional vegetation indices from past investigations.

Vegetation indices	Formula	Reference
Visible spectral vegetation indices		
Normalized Green Red Difference Index (NGDRI)	(B3-B4)/(B3+B4)	[62]
Red Green Blue Vegetation Index (RGBVI)	[B32-(B2xB4)]/[B32+(B2xB4)]	[63]
Excess green index (ExG)	2xB3-B4-B2	[64]
Plant Pigment Ratio (PPR)	(B3-B2)/(B3+B2)	[65]
Visible Atmospheric Resistance Index (VARI)	(B3-B4)/(B3+B4-B2)	[66]
Normalized Red Blue Index (NRBI)	(B4-B2)/(B4+B2)	[67]
Triangular greenness index (TGI)	-0.5x[(λB4-λB)x(B4-B3)-(λB4-λB3)x(B4-B2)]	[69]
Near infrared vegetation indices		
Normalized Difference Vegetation Index (NDVI)	(B8-B4)/(B8+B4)	[69]
Ratio simple vegetation index 1 (RVI1)	B8/B4	[70]
Difference Vegetation Index (DVI)	B8-B4	[62]
Green Difference Vegetation Index (GDVI)	B8-B3	[62]
Soil-adjusted vegetation index (SAVI)	(B8-B4)/(B8+B4+L)x(1+0.5)	[71]
Green normalized difference vegetation index (GNDVI)	(B8-B3)/(B8+B3)	[72]
Optimized SAVI (OSAVI)	(B8-B4)/(B8+B4+0.16)x(1+0.16)	[73]
Modified SAVI (MSAVI)	0.5x{2xB8+1-√[(2xB8+1)2-8x(B8-B4)]}	[74]
Normalized Difference Water Index (NDWI)	(B8-B11)/(B8+B11)	[75]
Red-edge vegetation indices		
Normalized Difference Red-edge Index (NDRE)	(B8-B5)/(B8+B5)	[72]
Canopy Chlorophyll Content Index (CCCI)	(NDRE-c0NDVI)/(c1NDVI-c0NDVI)	[18]
Simplified CCCI (SCCCI)	(NDVI/NDRE)	[76]
MERIS Terrestrial Chlorophyll Index (MTCI)	(B6-B5)/(B5-B4)	[77]
Ratio Simple Ratio Vegetation Index 2 (RVI2)	B6/B5	[78]
Modified NDVI (MNDVI)*.	(B7-B6)/(B7+B6)	[78]
Triangular core red-edge vegetation index (RETVI)	100x(B8-B5)-10x(B8-B3)	[17]
Simple ratio red-edge (SRRE)	B8/B5	[70]
Red-edge normalized vegetation index (RERNDVI)	(B8-B4)/(B8+B4)x√(B6/B5)	[79]
Red-edge position (REP)	λB5-(λB6-λB5)x[(B4+B7)/2-B5] /(B6-B5)	[80]
Chlorophyll absorption transformed reflectance index (TCARI)	3*[(B5-B4)-0.2x(B4E-B3)x(B5/B4)]	[81]
Canopy Double Peak Nitrogen Index (DCNI)	(B6-B5)/(B5-B4)/(B6-B4+0.03)	[82]
Chlorophyll absorption modified into reflectance index (MCARI)	[B5-B4)-0.2x(B5-B3)]x(B5/B4)	[83]

The nomenclature of the spectral bands was B2 (blue, 492 nm), B3 (green, 559 nm), B4 (red), B5 (red-edge 1, 704 nm), B6 (red-edge 2, 740 nm), B7 (red-edge 3, 780 nm), B8 (near infrared 833 nm), B11 (short-wave infrared spectral range 1, 1375 nm) and B12 (short-wave infrared spectral range 2, 1612 nm). The λ were expressed in nm.

```
if(i!=j & i!=k & j!= k){          #Filter for i, j and k to be different
    #===================================VI_1-14 are individual vegetation indices==============================
    a <- M[,i]; b <- M[,j]; c <- M[,k]  #assignment of a, b and c as the selected columns of matrix M
    VI1  <- a-b; VI2  <- a/b;
    VI3  <- (a-b)/(a+b)
    VI4  <- (a-b)/(a+b+0.25)*1.25
    VI5  <- (a-b)/(a+b+0.5)*1.5
    VI6  <- (a-b)/(a+b+0.75)*1.75
    VI7  <- (2*a+1-(sqrt((2*a+1)^2-8*(a-b))))/2
    VI8  <- (a-b)/(a+b-c)
    VI9  <- ((a)^2-(b*c))/((a)^2+(b*c))
    VI10 <- 100*(a-b)-10*(a-c)
    VI11 <- ((a-b)-0.2*(a-c))*(a/b)
    VI12 <- (a-b)*(b-c)/(a-c+0.03)
    VI13 <- (a-b)/(a+b)/(a-c)/(a+c)
    VI14 <- 2.5*(a-b)/((a+6*b-7.5*c)+1)

    #===================================VII_1-14 are dVIisor vegetation indices==============================
    dVIisor <- c(sample(firstband:n,3,replace = FALSE)); i2<-divisor[1]; j2<-divisor[2]; k2<-divisor[3]
    aa <- M[,i2]; bb <- M[,j2]; cc <- M[,k2]  #assignment of aa, bb and cc as the selected columns of M
    VII1  <- aa-bb
    VII2  <- aa/bb
    VII3  <- (aa-bb)/(aa+bb)
    VII4  <- (aa-bb)/(aa+bb+0.25)*1.25
    VII5  <- (aa-bb)/(aa+bb+0.5)*1.5
    VII6  <- (aa-bb)/(aa+bb+0.75)*1.75
    VII7  <- (2*aa+1-(sqrt((2*aa+1)^2-8*(aa-bb))))/2
    VII8  <- (aa-bb)/(aa+bb-cc)
    VII9  <- ((aa)^2-(bb*cc))/((aa)^2+(bb*cc))
    VII10 <- 100*(aa-bb)-10*(aa-cc)
    VII11 <- ((aa-bb)-0.2*(aa-cc))*(aa/bb)
    VII12 <- (aa-bb)*(bb-cc)/(aa-cc+0.03)
    VII13 <- (aa-bb)/(aa+bb)/(aa-cc)/(aa+cc)
    VII14 <- 2.5*(aa-bb)/((aa+6*bb-7.5*cc)+1)

    #=========================C are the combined vegetation indices (e.g. C89 = VI8/VII9)=========================
    C12<-VI1/VII2;C13<-VI1/VII3;C14<-VI1/VII4;C15<-VI1/VII5;C16<-VI1/VII6;C17<-VI1/VII7;C18<-VI1/VII8
    C19<-VI1/VII9;C110<-VI1/VII10;C111<-VI1/VII11;C112<-VI1/VII12;C113<-VI1/VII13;C114<-VI1/VII14
    C23<-VI2/VII3;C24<-VI2/VII4;C25<-VI2/VII5;C26<-VI2/VII6;C27<-VI2/VII7;C28<-VI2/VII8;C29<-VI2/VII9
    C210<-VI2/VII10;C211<-VI2/VII11;C212<-VI2/VII12;C213<-VI2/VII13;C214<-VI2/VII14
    C34<-VI3/VII4;C35<-VI3/VII5;C36<-VI3/VII6;C37<-VI3/VII7;C38<-VI3/VII8;C39<-VI3/VII9;C310<-VI3/VII10
    C311<-VI3/VII11;C312<-VI3/VII12;C313<-VI3/VII13;C314<-VI3/VII14
    C45<-VI4/VII5;C46<-VI4/VII6;C47<-VI4/VII7;C48<-VI4/VII8;C49<-VI4/VII9;C410<-VI4/VII10;C411<-VI4/VII11
    C412<-VI4/VII12;C413<-VI4/VII13;C414<-VI4/VII14
    C56<-VI5/VII6;C57<-VI5/VII7;C58<-VI5/VII8;C59<-VI5/VII9;C510<-VI5/VII10;C511<-VI5/VII11
    C512<-VI5/VII12;C513<-VI5/VII13;C514<-VI5/VII14
    C67<-VI6/VII7;C68<-VI6/VII8;C69<-VI6/VII9;C610<-VI6/VII10;C611<-VI6/VII11;C612<-VI6/VII12
    C613<-VI6/VII13;C614<-VI6/VII14
    C78<-VI7/VII8;C79<-VI7/VII9;C710<-VI7/VII10;C711<-VI7/VII11;C712<-VI7/VII12;C713<-VI7/VII13;C714<-VI7/VII14
    C89<-VI8/VII9;C810<-VI8/VII10;C811<-VI8/VII11;C812<-VI8/VII12;C813<-VI8/VII13;C814<-VI8/VII14
    C910<-VI9/VII10;C911<-VI9/VII11;C912<-VI9/VII12;C913<-VI9/VII13;C914<-VI9/VII14
    C1011<-VI10/VII11;C1012<-VI10/VII12;C1013<-VI10/VII13;C1014<-VI10/VII14
    C1112<-VI11/VII12;C1113<-VI11/VII13;C1114<-VI11/VII14
    C1213<-VI12/VII13;C1214<-VI12/VII14
    C1314<-VI13/VII14

    #============================VIs contains the matrix M and the vegetation indices============================
    VIs <- cbind(M,I1,I2,I3,I4,I5,I6,I7,I8,I9,I10,I11,I12,I13,I14,C12,C13,C14,C15,C16,C17,C18,C19,C110,C111,
                 C112,C113,C114,C23,C24,C25,C26,C27,C28,C29,C210,C211,C212,C213,C214,C34,C35,C36,C37,C38,C39,C310,
                 C311,C312,C313,C314,C45,C46,C47,C48,C49,C410,C411,C412,C413,C414,C56,C57,C58,C59,C510,C511,C512,
                 C513,C514,C67,C68,C69,C610,C611,C612,C613,C614,C78,C79,C710,C711,C712,C713,C714,C89,C810,C811,C812,
                 C813,C814,C910,C911,C912,C913,C914,C1011,C1012,C1013,C1014,C1112,C1113,C1114,C1213,C1214,C1314)
```

Figure S1. Calculate individual ($VI_{1\text{-}14}$) and combined ($C_{12\text{-}1314}$) vegetation indices during one iteration using R software. The example for the individual VI_8 and its divisors for combined indexes ($C_{8/9\text{-}14}$) is marked in yellow background.

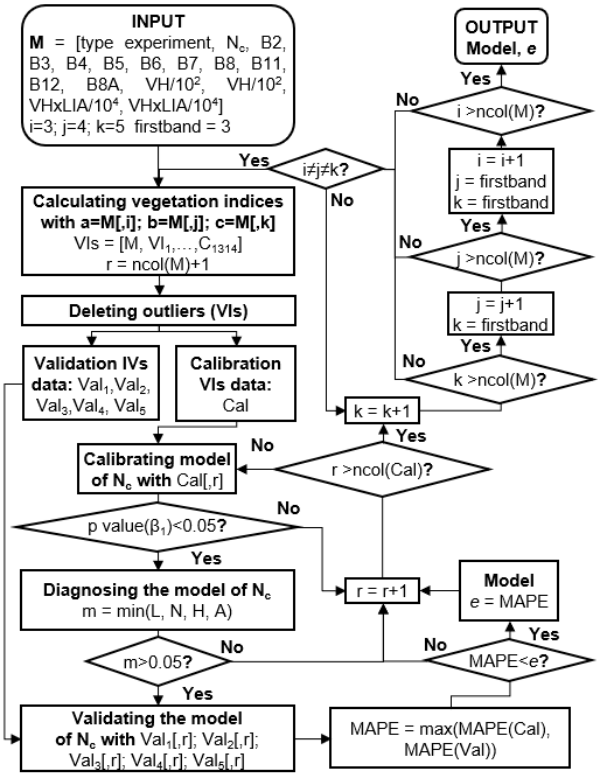

Figure S2. Conceptualization of the iteration function diagram (loop) used to generate, evaluate and select regression models with vegetation indices. IVs correspond to the vegetation indices in Figure S1; ncol(M) is a function of the R software to calculate the number of columns in a matrix. The letters L, N, H, and A are the p-values of the linearity (*"RESET"*), normality (*"Kolmogorov-Smirnov"*), homoscedasticity (*"Breusch-Pagan"*), and autocorrelation (*"Durbin-Watson"*) tests, respectively.