

Supplementary Materials

Table S1. Description of calculated ALS and SPOT 5 variables. Variables selected in k-MSN model are in bold.

Name	Data	Description
L_L30M_01	ALS, first echo points	Height of the point at the 10th percentile.
L_L30M_02	ALS, first echo points	Height of the point at the 20th percentile.
L_L30M_03	ALS, first echo points	Height of the point at the 30th percentile.
L_L30M_04	ALS, first echo points	Height of the point at the 40th percentile.
L_L30M_05	ALS, first echo points	Height of the point at the 50th percentile.
L_L30M_06	ALS, first echo points	Height of the point at the 60th percentile.
L_L30M_07	ALS, first echo points	Height of the point at the 70th percentile.
L_L30M_08	ALS, first echo points	Height of the point at the 80th percentile.
L_L30M_09	ALS, first echo points	Height of the point at the 90th percentile.
L_L30M_10	ALS, first echo points	Height of the point at the 100th percentile.
L_L30M_11	ALS, last echo points	Height of the point at the 10th percentile.
L_L30M_12	ALS, last echo points	Height of the point at the 20th percentile.
L_L30M_13	ALS, last echo points	Height of the point at the 30th percentile.
L_L30M_14	ALS, last echo points	Height of the point at the 40th percentile.
L_L30M_15	ALS, last echo points	Height of the point at the 50th percentile.
L_L30M_16	ALS, last echo points	Height of the point at the 60th percentile.
L_L30M_17	ALS, last echo points	Height of the point at the 70th percentile.
L_L30M_18	ALS, last echo points	Height of the point at the 80th percentile.
L_L30M_19	ALS, last echo points	Height of the point at the 90th percentile.
L_L30M_20	ALS, last echo points	Height of the point at the 100th percentile.
L_L30M_27	ALS, first echo points	Mean height of points above 5 m.
L_L30M_28	ALS, first echo points	Standard deviation of points above 2 m.
L_L30M_29	ALS, first echo points	Ratio of the number of points above 2 m to the number of all points.
L_L30M_30	ALS, last echo points	Ratio of the number of points above 2 m to the number of all points.
L_L27M_11	ALS, last echo points	Ratio of the number of points with height smaller or equal to 1.5 m to all points.
L_L27M_12	ALS, last echo points	Ratio of the number of points with height smaller or equal to 3.5 m to all points.
L_L27M_13	ALS, last echo points	Ratio of the number of points with height smaller or equal to 5.5 m to all points.
L_L27M_14	ALS, last echo points	Ratio of the number of points with height smaller or equal to 7.5 m to all points.
L_L27M_15	ALS, last echo points	Ratio of the number of points with height smaller or equal to 9.5 m to all points.
L_L27M_16	ALS, last echo points	Ratio of the number of points with height smaller or equal to 11.5 m to all points.
L_L27M_17	ALS, last echo points	Ratio of the number of points with height smaller or equal to 13.5 m to all points.
L_L27M_18	ALS, last echo points	Ratio of the number of points with height smaller or equal to 15.5 m to all points.
L_VD8530VD	ALS, first and only echo points	Ratio of the number of points above 0,3*85th percentile height to the number of all points.
L_VD8580VD	ALS, first and only echo points	Ratio of the number of points above 0,8*85th percentile height to the number of all points.
L_VD9030VD	ALS, first and only echo points	Ratio of the number of points above 0,3*90th percentile height to the number of all points.
L_VD9080VD	ALS, first and only echo points	Ratio of the number of points above 0,8*90th percentile height to the number of all points.
L_VD9530VD	ALS, first and only echo points	Ratio of the number of points above 0,3*95th percentile height to the number of all points.
L_VD9580VD	ALS, first and only echo points	Ratio of the number of points above 0,8*95th percentile height to the number of all points.
L_X_VD	ALS, all echo points	Ratio of the number of points above 2 m to the number of all points.

L_X_ZP85	ALS, all echo points	Ratio of the number of points above 2 m to the number of all points.
L_X_ZP95	ALS, all echo points	Ratio of the number of points above 2 m to the number of all points.
h2d30	ALS	L_L30M_09^1.7 * L_VD9530VD
hd30	ALS	L_L30M_09^0.7 * L_VD9530VD
hd80	ALS	L_L30M_09^0.7 * L_VD9580VD
L08p2	ALS	L_L30M_02^2
Sf_1_MEAN	SPOT 5, pansharpened	Mean value of band 1.
Sf_2_MEAN	SPOT 5, pansharpened	Mean value of band 2.
Sf_3_MEAN	SPOT 5, pansharpened	Mean value of band 3.
Sf_4_MEAN	SPOT 5, pansharpened	Mean value of band 4.
Sf_1_SD	SPOT 5, pansharpened	Standard deviation of band 1.
Sf_2_SD	SPOT 5, pansharpened	Standard deviation of band 2.
Sf_3_SD	SPOT 5, pansharpened	Standard deviation of band 3.
Sf_4_SD	SPOT 5, pansharpened	Standard deviation of band 4.
SM_1_MEAN	SPOT 5, multispectral	Mean value of band 1.
SM_2_MEAN	SPOT 5, multispectral	Mean value of band 2.
SM_3_MEAN	SPOT 5, multispectral	Mean value of band 3.
SM_4_MEAN	SPOT 5, multispectral	Mean value of band 4.
SM_1_SD	SPOT 5, multispectral	Standard deviation of band 1.
SM_2_SD	SPOT 5, multispectral	Standard deviation of band 2.
SM_3_SD	SPOT 5, multispectral	Standard deviation of band 3.
SM_4_SD	SPOT 5, multispectral	Standard deviation of band 4.
Sf_NDVI1_MEAN	SPOT 5, pansharpened	Mean value of index calculated using bands 1 and 2.*
Sf_NDVI2_MEAN	SPOT 5, pansharpened	Mean value of index calculated using bands 3 and 2.*
Sf_NDVI3_MEAN	SPOT 5, pansharpened	Mean value of index calculated using bands 3 and 1.*
Sf_NDVI1_SD	SPOT 5, pansharpened	Standard deviation of index calculated using bands 1 and 2.*
Sf_NDVI2_SD	SPOT 5, pansharpened	Standard deviation of index calculated using bands 3 and 2.*
Sf_NDVI3_SD	SPOT 5, pansharpened	Standard deviation of index calculated using bands 3 and 1.*
SM_NDVI1_MEAN	SPOT 5, multispectral	Mean value of index calculated using bands 1 and 2.*
SM_NDVI2_MEAN	SPOT 5, multispectral	Mean value of index calculated using bands 3 and 2.*
SM_NDVI3_MEAN	SPOT 5, multispectral	Mean value of index calculated using bands 3 and 1.*
SM_NDVI1_SD	SPOT 5, multispectral	Standard deviation of index calculated using bands 1 and 2.*
SM_NDVI2_SD	SPOT 5, multispectral	Standard deviation of index calculated using bands 3 and 2.*
SM_NDVI3_SD	SPOT 5, multispectral	Standard deviation of index calculated using bands 3 and 1.*
Sf_1_MEANh2d30	SPOT 5, pansharpened, ALS	Sf_1_MEAN * h2d30
Sf_NDVI2_MEANh2d30	SPOT 5, pansharpened, ALS	Sf_NDVI2_MEAN * h2d30
SM_NDVI2_MEANh2d30	SPOT 5, multispectral, ALS	SM_NDVI2_MEAN * h2d30
0		

* Index is calculated using equation (band a – band b)/(band a + band b).