Supplementary Materials

Table S1. The descriptions and value ranges of the spectral, shape and texture features.

Feature Type	Name	Description	Value Range
Spectral	Mean (S1-S4)	The average value of the image object in each raster layer (R, G, B, NIR)	[0, +∞)
	Standard deviation (S5-S8)	The standard deviation of the image object in each raster layer (R, G, B, NIR)	[0, +∞)
	Brightness (S9)	The mean value of the image object in all layers	[0, +∞)
	Normalized Difference Vegetation Index (NDVI, S10)	The ratio of the difference between Near InfraRed and Red band and their sum	[-1, 1]
Shape	Asymmetry (Sh1)	The ratio of the lengths of an approximated ellipse minor and the major axes	[0, 1]
	Border index (Sh2)	The ratio between the border lengths of the image object and the smallest enclosing rectangle	[1, +∞), 1=ideal
	Compactness (Sh3)	The product of the length and the width, divided by the number of pixels	[0, +∞), 1=ideal
	Density (Sh4)	The number of pixels forming the image object divided by its approximated radius, based on the covariance matrix	[0, +∞)
	Elliptic Fit (Sh5)	Based on an ellipse with the same area as the selected image object, the area of the image object outside the ellipse is compared with the area inside the ellipse that is not filled by the image object	[0, 1]; 1 indicates a perfect fit
	Main direction (Sh6)	The direction of the eigenvector belonging to the larger of the two eigenvalues, derived from the covariance matrix of the spatial distribution of the image object	[0, 180]
	Radius of largest enclosed ellipse (Sh7)	The ratio of the radius of the largest enclosed ellipse to the radius of the original ellipse	[0, +∞)
	Radius of smallest enclosed ellipse (Sh8)	The ratio of the radius of the smallest enclosed ellipse to the radius of the original ellipse	[0, +∞)
	Rectangular Fit (Sh9)	Based on a rectangle with the same area as the image object, the area of the image object outside the rectangle is compared with the area inside the rectangle	[0, 1]; 1 indicates a perfect fit
	Roundness (Sh10)	The difference between the largest enclosing ellipse and the smallest enclosed ellipse	[0, +∞), 0=ideal
	Shape index (Sh11)	The Border Length feature of the image object divided by four times the square root of its area	[1, +∞), 1=ideal
Texture	Homogeneity (T1)	The value is high if the Gray-Level Co-occurrence Matrix (GLCM) concentrates along the diagonal	[0, 1]
	Contrast (T2)	The opposite of homogeneity. It is a measure of the amount of local variation in the image	[0, +∞)
	Dissimilarity (T3)	High if the local region has a high contrast	[0, +∞)
	Entropy (T4)	Measures the degree of equal distribution of the GLCM elements	[0, +∞)
	Ang.2nd moment (T5)	The sum of the normalized values in the parcel	[0, 1]
	Mean (T6)	The GLCM average value of the image object	[0, +∞)
	Standard deviation (T7)	The GLCM standard deviation of the image object	[0, +∞)
	Correlation (T8)	Measures the linear dependency of gray levels of neighboring pixels	[0, 1]

Table S2. The means and standard deviations corresponding to the accuracy obtained by the six methods using different sample size in two areas, i.e. K-Nearest Neighbor (KNN), Decision Tree (DT), Naïve Bayes (NB), Support Vector Machine (SVM), Random Forest (RF) and Genetic Programming (GP).

	Area 1		Area 2	
	Mean (%)	Standard deviation ($\times 10^{-2}$)	Mean (%)	Standard deviation ($\times 10^{-2}$)
KNN	73.9%	8.1	90.6%	2.1
DT	89.7%	7.2	91.6%	2.8
NB	83.0%	1.6	87.2%	1.2
SVM	84.1%	6.6	94.1%	1.6
RF	92.1%	5.6	96.6%	1.2
GP	95.0%	2.4	97.6%	1.1