

RF8sp53att.model

This is a Random Forest classifier model, and can classify 7 different species and 1 genus:

- *Globicephala macrorhynchus*
- *Pseudorca crassidens*
- *Steno bredanensis*
- *Stenella attenuata*
- *Stenella coeruleoalba*
- *Stenella longirostris*
- *Tursiops truncatus*
- *Delphinus* species

It was created with 500 trees and 54 attributes:

- the minimum and maximum frequencies
- the beginning and ending frequencies
- the mean and the standard deviation of the frequency
- the median frequency
- the center frequency = (maximum+minimum)/2
- the frequency range = maximum-minimum
- the relative frequency bandwidth = (maximum-minimum)/center
- the ratio of maximum frequency to minimum frequency
- the ratio of beginning frequency to ending frequency
- the frequency at the 25th, 50th and 75th percentiles of the whistle
- the frequency spread between the 75th and 25th percentiles (interquartile range)
- the mean and the standard deviation of the duty cycle, where the duty cycle is a measure of the amplitude modulation of the whistle
- the mean duty cycles in the first, second, third and fourth quarters of the whistle
- the coefficient of frequency modulation (COFM) (based on McCowan and Reiss 1995):
 - $COFM = \frac{\sum_{n=1}^{19} (f_{n+1} - f_n)}{10,000}$, where f_n is the frequency at the nth point of 20 evenly spaced points along the length of the whistle
- the duration
- the number of frequency steps up and down, where a step is defined as a change in frequency greater than 10%
- the total number of steps
- the mean slope
- the mean absolute slope
- the mean positive and negative slopes
- the ratio of mean positive slope to mean negative slope
- the sweep at the beginning and ending of the contour, where the sweep is defined as the direction of slope (positive slope=1, negative slope=-1, zero slope (flat) = 0)
- positive and negative boolean parameters describing the sweep at the beginning and ending of the contour
- the percentage of the whistle that has a positive slope, a negative slope, and zero slope (flat)
- the number of sweep patterns (positive-to-negative, negative-to-positive, positive-to-flat, negative-to-flat, flat-to-positive, flat-to-negative)
- the number of inflection points
- the shortest and longest times between inflection points and the ratio of longest to shortest
- the mean and standard deviation of the time between inflection points
- the median time between inflection points.

The random forest model was trained on 2,231 whistles collected during 6 cruises over 7 years in the eastern Tropical Pacific Ocean.

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