In the following step, any points with a relative elevation of less than one meter are eliminated from the dataset. Afterwards, waveforms are smoothed using moving function to reduce some of the noises at each waveform. Next, 11 structural features are generated for each waveform including:

1-integral of values of wave

2-Height of max of peak

3-location of max of peak

4-sum of all of peak heights

5-distance between first and last peak

6-witght to height ratio of first peaks;

7-sum of witght to height rashio of peaks

8-Intensity of first peak

9-location of first enerjy drop

10-number of peaks

11-NDSM height of first peak

These features will be utilized for subsequent processing steps.