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T.L. McWade[2], P.D. Morse[1], S. Gruber[2], and S.A. Wolfe[1]

[1]Geological Survey of Canada, 601 Booth Streeet, Ottawa, Ontario K1A 0E8
[2]Carleton University, 1125 Colonel By Drive, Ottawa, Ontario K1S 5B6

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ABSTRACT

The purpose of this Open File is to identify and map a locally common yet unclassified set of landforms first observed during summer 2015 fieldwork in continuous permafrost of the Lac de Gras region of Northwest Territories. Quantitative and qualitative data extracted from 152 landforms using aerial photographs and LiDAR data were used to describe and quantify the general form. The landforms exhibit a continuous depression situated several meters behind and parallel to a steep, curvilinear hillslopes, beneath which is a gentle footslope. The hillslopes appear to incise the margins of till blanket deposits, and the footslopes are covered with boulders. According to morphological characteristics, the mapped landforms were divided into three classes, interpreted as early, late, and final stages of an apparent time-transgressive landform evolution. Based on extracted morphological characteristics and field observations the landforms have been tentatively termed retrogressive creeping slumps.

DISCLAIMER

Her Majesty the Queen in right of Canada, as represented by the Minister of Natural Resources ("Canada"), does not warrant or guarantee the accuracy or completeness of the information ("Data") and does not assume any responsibility or liability with respect to any damage or loss arising from the use or interpretation of the Data.

The Data are intended to convey regional trends and should be used as a guide only. The Data should not be used for design or construction at any specific location, nor are the Data to be used as a replacement for the types of site-specific geotechnical investigations.

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INTRODUCTION

During summer fieldwork in the vicinity of Lac de Gras, Northwest Territories (Figure 1), an indeterminate periglacial landform was identified (Figure 2) within this continuous permafrost landscape (Heginbottom et al., 1995). The landform consists of a curvilinear hillslope, with a continuous depression or trough situated several meters behind and parallel to the hillslope, and with a low-grade footslope beneath the hillslope (Figure 2a-d). The hillslopes appear to incise the margins of diamicton deposits that form plateaus with patterned ground at the surface. Footslopes below the hillslopes are mantled with boulders (Figure 2e) and often feature transverse ridges and furrows on their surface. Despite very low summer precipitation, water was commonly observed ponded in small pits on some of the landforms (Figure 2h). The presence of the trough and its proximity to the slump-like change in elevation may be unique to these landforms and is the main identifying feature. A Canadian Northern Economic Development Agency funded borehole (RC15-150) drilled the previous winter in a trough above one of the hillslopes. The core sample indicated massive ice at depth, and the following summer when the site was revisited it was noted that the borehole occupied a trough located above one of the hillslopes. Therefore, this landform development may be connected to the occurrence of ice at depth. These landforms seemed abundant in the small area surveyed.

The purpose of this report is to identify and map the location of the landforms. This is achieved based on interpretation of aerial photographs and on quantitative assessment of landform morphologies derived from high-resolution digital elevation data. A classification scheme is developed to characterize the mapped landforms with respect to their apparent degree of hillslope evolution.

1 BACKGROUND

1.1 Periglacial Environments

Periglacial environments refer to areas with an arctic or sub-arctic climate where frost processes dominate and permafrost is common. These environments can be found on the edge of polar or glacial landscapes and account for approximately a quarter of the Earth's surface (French, 2007). Periglacial landscapes form due to climatic conditions and regional lithology and relate to the presence or distribution of ice found in either the bedrock or surficial materials. The presence of continuous and thick permafrost in the subarctic is likely an indicator of a more severe climate condition in the past.

Permafrost is defined as ground having a temperature that remains below freezing (0°C) for at least two consecutive years (IPA, 2005). Thermokarst is the process by which a number of characteristic landforms develop due to thaw of ice-rich permafrost and settling of the ground surface as the ice melts. Consequently, thermokarst is an indicator of the distribution of ice-rich permafrost. Thermokarst processes such as retrogressive thaw slumping are thought to increase in severity and become more prominent as the changing climate affects periglacial environments (e.g., Lantz and Kokelj, 2008). Slow downward deformation (movement) of the ground can also occur due to creep of frozen ground where terrain is underlain by ice-rich permafrost (e.g., Dallimore et al., 1996). Understanding and identifying thawing or creeping permafrost is important as there are impacts on ground stability, infrastructures, and the local ecology.

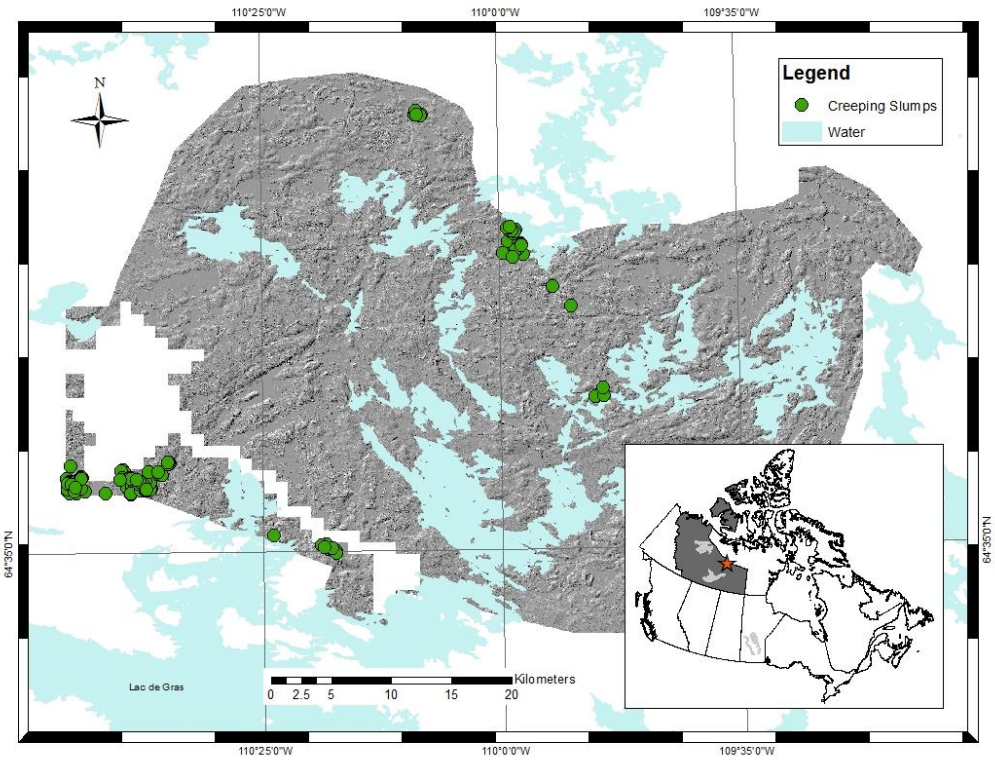

Figure 1: Location of the Lac de Gras study region approximately 320 km northeast of Yellowknife, NT. Locations of 152 mapped landforms are indicated by points. Shaded relief data are derived from LiDAR provided by the Dominion Diamond Ekati Corporation.

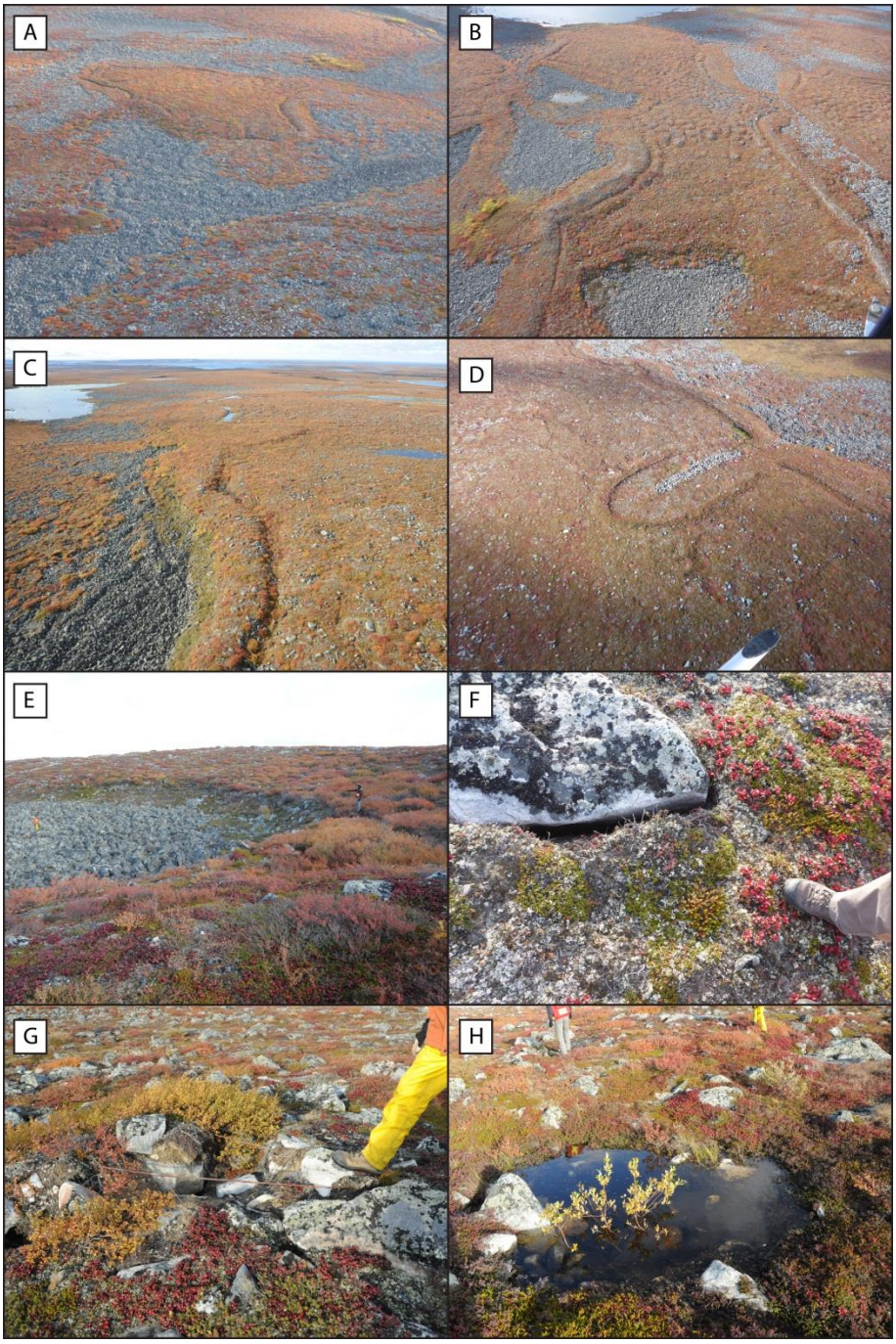

Figure 2. Retrogressive creeping slumps in the field, 5 September 2015. (A) Multiple landforms incising parent terrain, showing curvilinear hillslopes with corresponding troughs and footslopes with transverse ridges and furrows on their surfaces (64°39'32", 110°23'14"). (B) Hummocky terrain incised by multiple slumps (64°38'38", 110°36'31"). (C) Slump S94 (64°35'08", 110°18'08"). (D) Omega-shaped trough around a slump (64°37'11", 110°47'32"). (E) Ground-level perspective of the transition from upper parent material to a lower boulder lag with two people for scale (64°35'04", 110°18'24"). (F) Soil creep (64°35'14", 110°18'35"). (G) Frost heaving in parent material (64°35'15", 110°18'38"). (H) Thermokarst pit on parent material (64°35'14", 110°18'44").

The depth at which massive ground ice occurs and the ice thickness varies greatly at a local and regional scale. Currently the extent and origin of permafrost and ground ice in the Slave Geological Province is not well mapped or understood (Wolfe et al., 1997), and at local scales the true extent to which massive ground ice influences terrain sensitivity is unclear.

1.2 Hillslope Processes and Evolution

In periglacial regions, down slope movement of material under the presence of gravity is associated with slow and rapid processes. Slow processes include solifluction, gelifluction, and frost creep, whereas rapid ones include active-layer detachment slides, debris flows, rockfalls, and retrogressive thaw slumps (French 2007). The relief of the landforms observed in the field suggests that the features may develop from retrogressive thaw slumping or deep-seated creep of massive ground ice. Each of these processes uniquely affects slope morphology.

Commonly associated with ice-rich fine-grained glaciolacustrine deposits and diamictons, retrogressive thaw slumps are a form of mass wasting initiated by thermal degradation due to an adjacent water body, where permafrost thaw creates a hillslope that retreats retrogressively, with thawed materials forming a debris flow that moves materials along a low-gradient footslope (Figure 3a) (Burn and Lewkowicz, 1990; Kokelj et al., 2009). Thaw slumps stabilize when the ice-rich material is covered by enough overburden to prevent further retrogression, but if thaw of ice-rich permafrost continues at the toe of the debris slope by the adjacent water body, thaw slumping can can reinitiate, creating polycyclic thaw slump activity (Kokelj et al., 2009). The headwall of the hillslope can retreat several meters in one season if the terrain is significantly ice-rich and if the air temperatures are warm (Burn and Lewkowicz, 1990; Lantz and Kokelj, 2008). The environmental effects of retrogressive thaw slumps are changes in water clarity and chemistry, loss of land, deepening of the active layer, and changes to the local food web (Mesquita et al., 2008; Kokelj et al., 2009).

Frost creep, the ratchet like movement of soil particles downslope occurs due to frost heaving the ground followed by thaw settlement, is dependent on freeze-thaw cycles, angle of slope, frost susceptibility of the soil, and moisture availability, and occurs with one-sided or two-sided freezing (Washburn, 1979). Diurnal freezing is associated with near surface frost creep, whereas seasonal freezing is associated with frost creep at a greater relative depth, and also with two-sided freezing (French, 2007). Deep-seated frost creep can also be represented by gradual downward and/or lateral movement (or deformation) of frozen ground (Figure 3b) (e.g., Dallimore et al., 1996).

1.3 Study Area

The study area surrounds the Ekati diamond mine located within the Great Slave Geological Province of Northwest Territories. This is located approximately 320 km northeast of Yellowknife in a zone of continuous permafrost, just north of the tree line, and approximately 200 km south of the Arctic Circle (Figure 1). Landscape evolution in this region is therefore closely linked to permafrost related processes. The study area is within the Tundra Plains Low Arctic ecoregion, and the primary terrain types are peatland, bedrock, block field, frost-jacked boulders, shrubs, tundra, and small lakes and ponds (Ecosystem Classification Group, 2012).

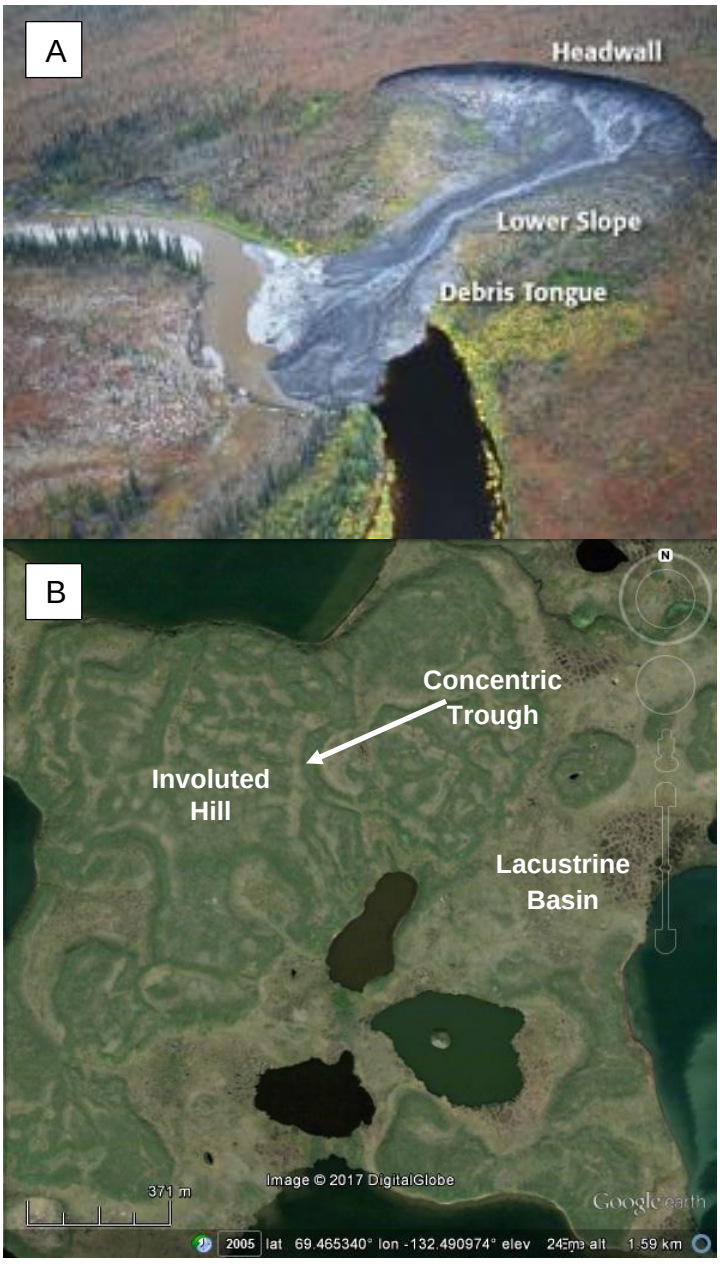

Figure 3. Examples of cold regions hillslope processes: (A) Retrogressive thaw slump on the Milner River near Sitigi lake, NWT. (Photo: Prince of Wales Northern Heritage Centre, http://www.nwtexhibits.ca/steppebison/climatechange/). index.html). (B) Involuted hills near Tuktoyaktuk, NWT, where deep-seated creep occurs. (Image: Google Earth).

The northern edge of the study area is predominately large bedrock outcrops, and there are more un-consolidated surficial materials near the southern edge of the study area. At this location there is significant ground ice in the form of visible ice wedges, polygons. However, borehole observations made between March and April 2015 during the Northwest Territories Geological Survey's Slave Province Surficial Materials and Permafrost Study field campaign indicate massive ice occurs at some locations at depth in the study area. Surficial geology within the Lac de Gras region is dominated by till deposits and bedrock (Figure 4) (Geological Survey of Canada, 2014), and Dredge et al. (1999) demonstrated massive ice occurs within some eskers and ice-contact outwash sediments.

The climate of this region ranges from sub-arctic continental to maritime arctic due to the distance from moderating water bodies and the latitude. The closest Environment Canada weather station is located at the Lupin gold mine (Lupin A, NU), about 100 km northwest of Ekati. Normal (1981-2010) annual total precipitation for this station is 298.5 mm of which 46% falls as snow. The normal mean annual air temperature is -10.9 °C, with July and January mean temperatures of 11.5 °C and -29.9 °C respectively (Environment Canada, 2017).

2 METHODS

2.1 Data

The image data used in this investigation includes digital aerial photographs and Light Detection and Ranging (LiDAR) imagery provided by the Dominion Diamond Ekati Corporation (2177 km^2). Field photos that aided interpretation of the results were taken by authors and Carleton colleagues. The data extracted from the LiDAR dataset includes a digital elevation model (DEM) from which shaded relief and aspect models were derived. Processing and analysis of geospatial datasets were conducted within ArcGIS®. The DEM coordinate system and extracted data are projected to North American Datum 1983 Universal Transverse Mercator Zone 12. Surficial geology data are for NTS 76-D (Geological Survey of Canada, 2014).

2.2 Identification and Data Extraction

Aerial photographs and shaded relief data (derived from the DEM) were used to identify the landforms such as shown in Figure 5. Once all landforms within the study area were located and identified, the coordinate values were generated for each point and saved.

During the identification process qualitative data were also collected. Regarding vegetation and water within proximity to the slump, a binary classification was used for vegetation, classed as present or not. A similar classification was applied to the presence of water. If water was observed in aerial photographs on any of the morphological categories the location was recorded. Feature location points were also used to assign surficial geology according to their location on the mapped surficial geology data for NTS 76-D.

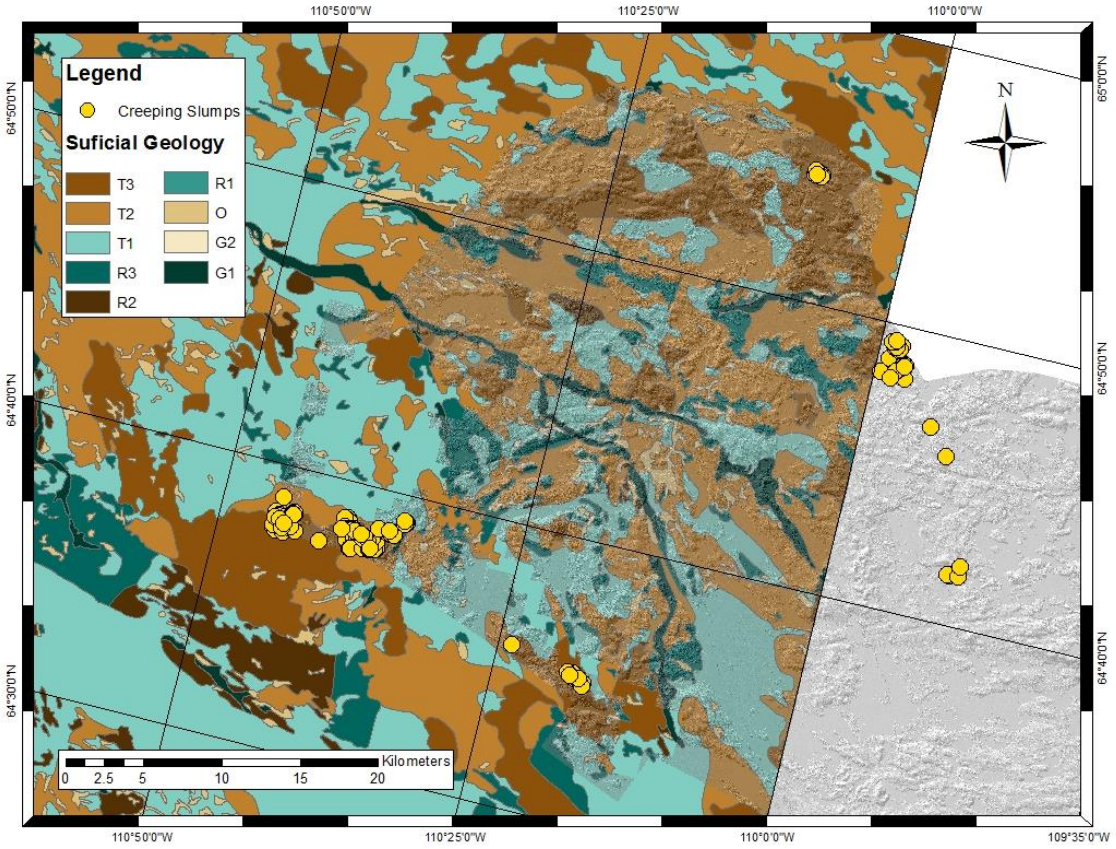

Figure 4. Location of 152 retrogressive creeping slumps with respect to surficial geology: T3 – Hummocky till, T2 – Till blanket, T1 – Till veneer; R3 –Metamorphic bedrock, R2 –Igneous bedrock, O – Organic deposits, undifferentiated, G1 –Esker sediments, G2 – Subaerial outwash fan sediments. Surficial geology is for NTS 76-D (Geological Survey of Canada, 2014).

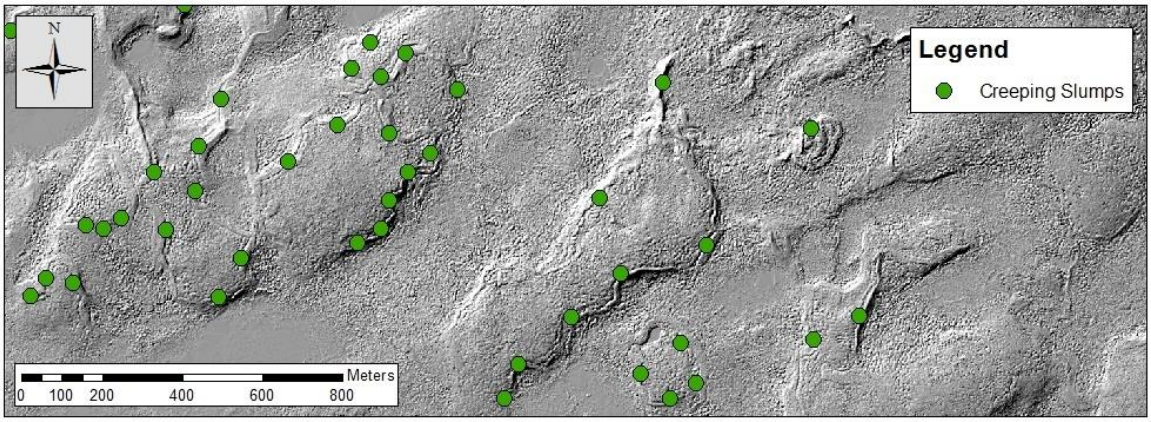

Figure 5. A subset of shaded relief data modelled from a 1 m resolution DEM extracted from LiDAR data showing 34 classified landforms. Typical landform class types are represented by S72 (Class 1; Figure 7), S46 (Class 2; Figure 8), and S46 (Class 3; Figure 9).

The main form of data extraction for each landform was through elevation profiles generated from the DEM. At the centre of the landform, where the point marker was placed, an elevation profile perpendicular to the hillslope face was extracted and the raw data was saved. On average, 3 elevation profiles were generated for each landform to assess within site variation. To maintain accuracy and account for potential spatial autocorrelation, the elevation profiles were required to be at least 10 m apart. When multiple elevation profiles were generated for a singular landform the raw data was denoted with a sequential number, for example: S11, S11_02, S11_03, etc. The raw data generated from each of the elevation profiles were then plotted (Appendix A) and visually analyzed for the key morphological categories.

2.3 Classification Scheme

A suite of slope profiles were apparent for the landforms, both in the field and in aerial imagery. To enable classification of this range of morphologies, a classification scheme was developed from visual inspection the available datasets to provide definitions for three discrete slope profiles. Each landform was assessed against general profiles and placed into the class which best approximates the extracted slope profile data. In theory there could be an infinite number of these classifications, however a limit needed to be drawn and three discrete classes were deemed representative.

The three slope profiles are composed of three to five morphological categories specific to their classification. The main morphological categories (Figure 6) are: the parent terrain, trough, ridge, hillslope, and footslope. Each of these categories differs in both slope and elevation. Class 1, exhibits all morphological categories (Figure 7). Class 2 is observed to have little to no parent terrain (Figure 8). This is thought to be the meeting place of two or more Class 1 landforms and the slope profile is as follows: footslope, hillslope, ridge, trough, ridge, hillslope, and footslope. Class 3 is identified simply by the presence of a ridge between two hillslopes with footslopes (Figure 9). There is no observed trough, and the mirroring hillslopes and footslopes have similar profiles.

2.4 Measurement of Profile Characteristics

Once all elevation profiles were compiled, elevation and relative distance data was used to compute dimensions for the morphological categories as indicated in Figure 6. Additional measurements derived from the data include the curvilinear length of the hillslope (measured in m along the break in slope at the top of the hillslope), and the short-line distances from each landform to the nearest water body. The raw data are presented in Appendix B, and descriptive statistics for the entire dataset, including measured and derived values are presented in Appendix C.

3 RESULTS

3.1 Distribution

In total 152 landforms were identified and classified within the study area (Figure 3), with 390 profiles extracted (Appendix A). Location coordinates are indicated in Appendix B. Of these landforms, 115 are located within the available surficial geology

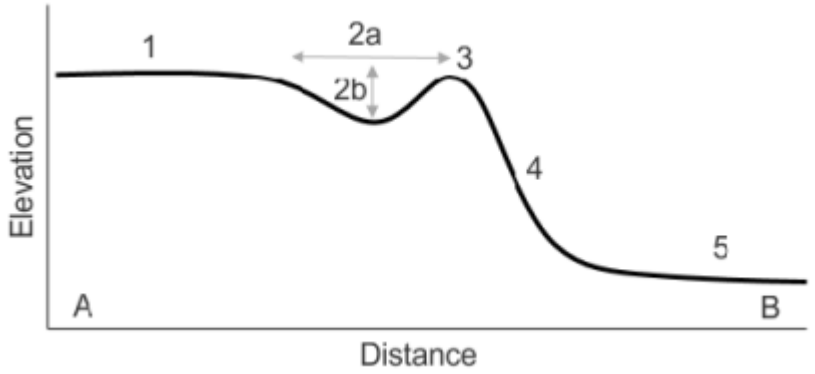

Figure 6. Schematic of a Class 1 landform which represents all morphological categories defined along one elevation transect. Relative distance is measured in metres from start point A and is contained within the A-B transect. Morphological categories include: (1) the parent terrain, mean elevation (m asl) data and relative distance (m) from start point A; (2a) calculated trough width (m); (2b) trough depth (m) calculated from trough minimum (m) and ridge maximum (m asl) values; (3) the ridge, maximum elevation point (m asl) and corresponding relative distance (m); (4) hillslope, calculated from the ridge elevation to the footslope elevation, provided in degrees and percent; and (5) the footslope, an average elevation value (m asl) and relative distance from start point A (m).

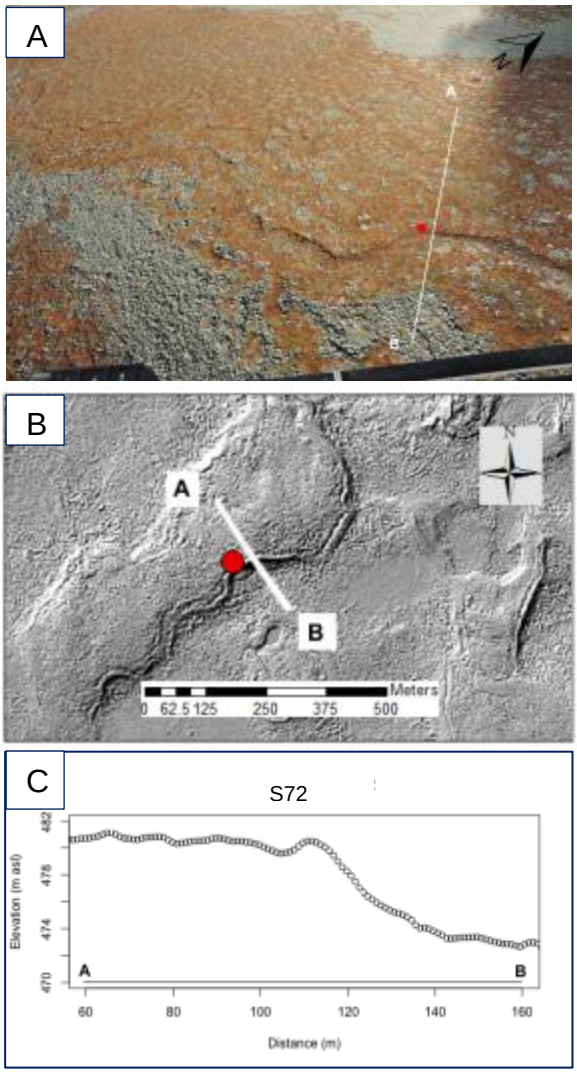

Figure 7. Class 1 landform archetype, S72. (A) Aerial photograph of the site, September 2015 (Photo: Peter Morse, GSC). (B) Landform as visible in shaded relief. (C) Extracted elevation profile from transect A-B.

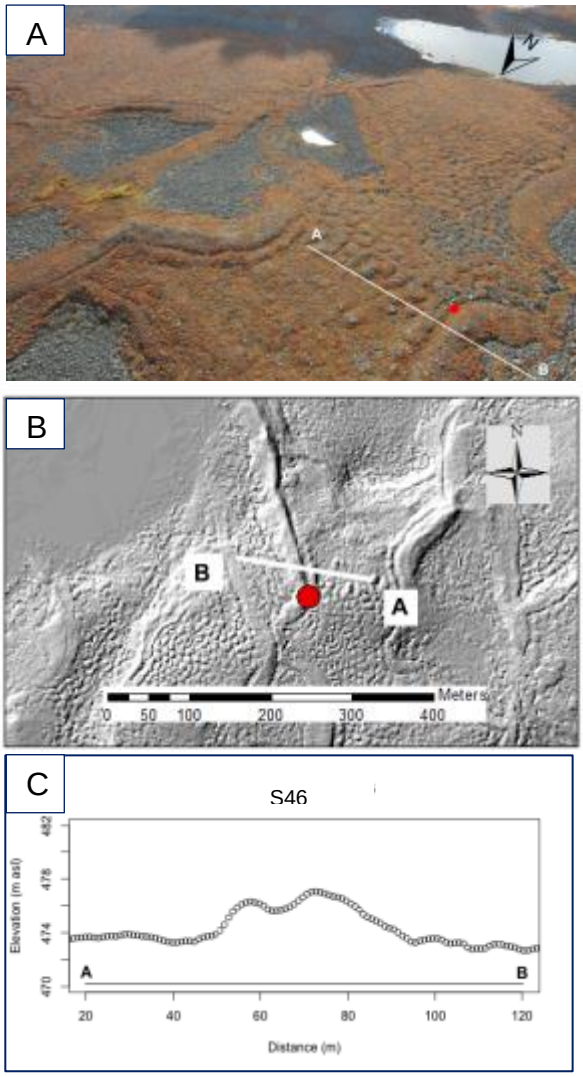

Figure 8. Class 2 landform archetype, S46. (A) Aerial photograph of the site, September 2015 (Photo: Peter Morse, GSC). (B) Landform as visible in shaded relief. (C) Extracted elevation profile from transect A-B.

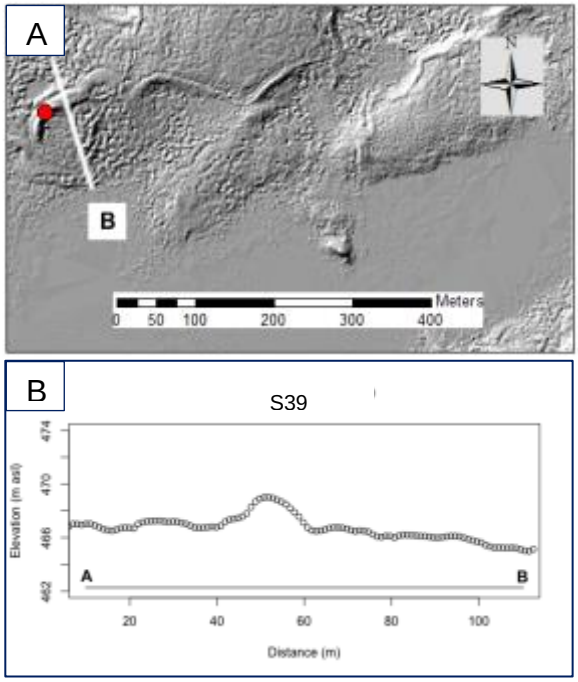

Figure 9. Class 3 landform archetype, S39. (A) Landform as visible in shaded relief. (B) Extracted elevation profile from transect A-B.

data for map area NTS 76-D (Geological Survey of Canada, 2014) (Figure 4). Of this subset, most (88%) are located within hummocky till, with the remainder located in till blanket, till veneer and esker sediments (Figure 10). Of those located outside of hummocky till, most are within 400 m of a hummocky till deposit (Figure 11). Given the normal error in the scale at which the surficial geology is mapped, it is likely that most of the 14 sites are actually within a till deposit, including 4 that were assigned to esker sediments.

3.2 Geomorphology

The dominant aspect the hillslope faces is southeast and the sub-dominant direction is northwest (Figure 12). Overall average values for morphological components are 464.9 m asl elevation, 5.8 m total height, 8.8° hillslope, 123 m total length, 0.5 m trough depth, and 7.7 m trough width (Appendix C).

The total length of the landform along the headwall separated by class is shown in Figure 13. ANOVA results indicate classes are not statistically significantly different at the 0.05 level. The range of values for total height of the landform from the footslope elevation to the parent terrain elevation is shown in Figure 14. Total height is significantly different among classes, driven by Class 1 which, according to a Tukey HSD test for unequal numbers, is significantly different than Classes 2 and 3 ($p < 0.001$), whereas Classes 2 and 3 are statistically similar. Figure 15 shows the range of values for hillslope angle. Class differences tested by ANOVA were not significant ($p = 0.071$), however, the majority of large outliers across all classes occur within Class 1 hillslopes. Trough dimensions for Classes 1 and 2 are summarized in Figure 16; Class three has no recorded trough data. Trough dimensions are not statistically different between classes ($\alpha = 0.05$).

The distribution of water bodies and surficial materials has an influence on landform morphology. Figure 17 shows the relation between hillslope angle and distance from water. Only 7 of the 152 landforms have water within 50 m of toe of the footslope, however those within 100 m of water are generally steeper with increasing proximity.

4 DISCUSSION

4.1 Classification

Tentatively, the classification scheme shown in Figures 7 to 9 may represent stages of the progression of landform evolution with time, meaning that over time Class 1 types will become Class 2 types, and the final stage taking place over the longest time scale will be a remnant Class 3 type. This classification suggests that a Class 3 profile may represent a mature form that is more stable than a Class 1. The following defines the classes based on geomorphology and provides the temporal explanation.

Class 1 types are relatively easy to identify in the datasets due to a well-defined trough and the extensive parent terrain behind the headwall. This class is the likely result following initiation of mass movement in this terrain, and the full suite of morphological characteristics is well represented (Figure 7). Notably, no sites have yet been identified that demonstrate primary landform initiation. Class 1 features have vegetation present on all morphological categories, the densest of which is in the trough, which may due to the accumulation of precipitation within the depression, both in winter and summer. There is

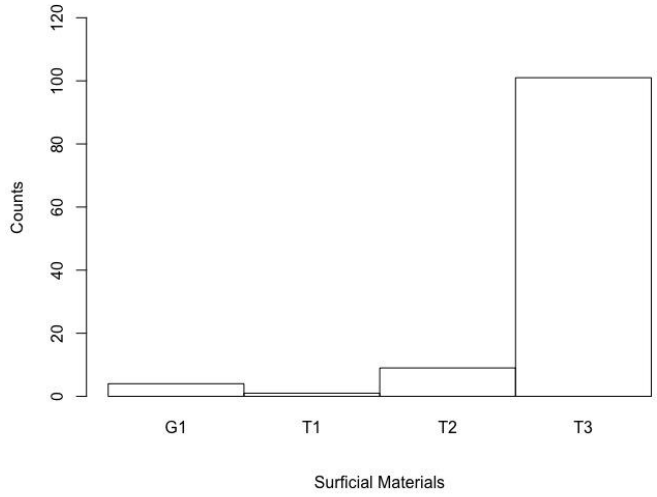

Figure 10. Counts of landforms associated with surficial geology classes.

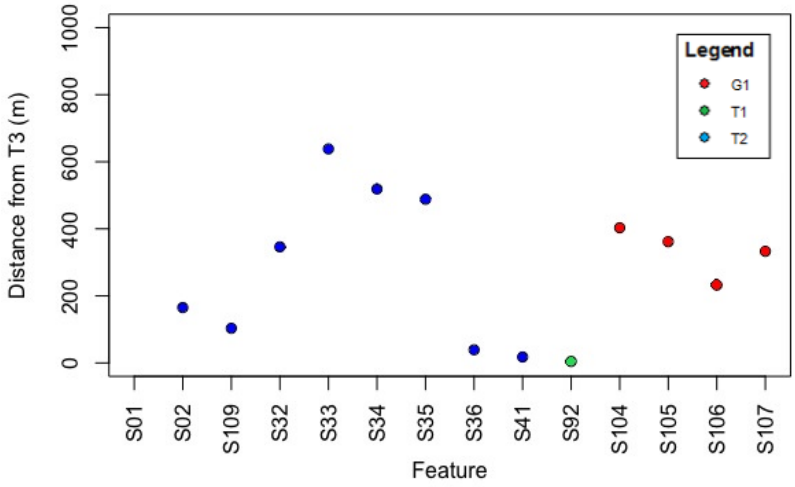

Figure 11. Plot of the straight line distance from a deposit of till blanket to the 14 landforms not associated with till blanket surficial geology.

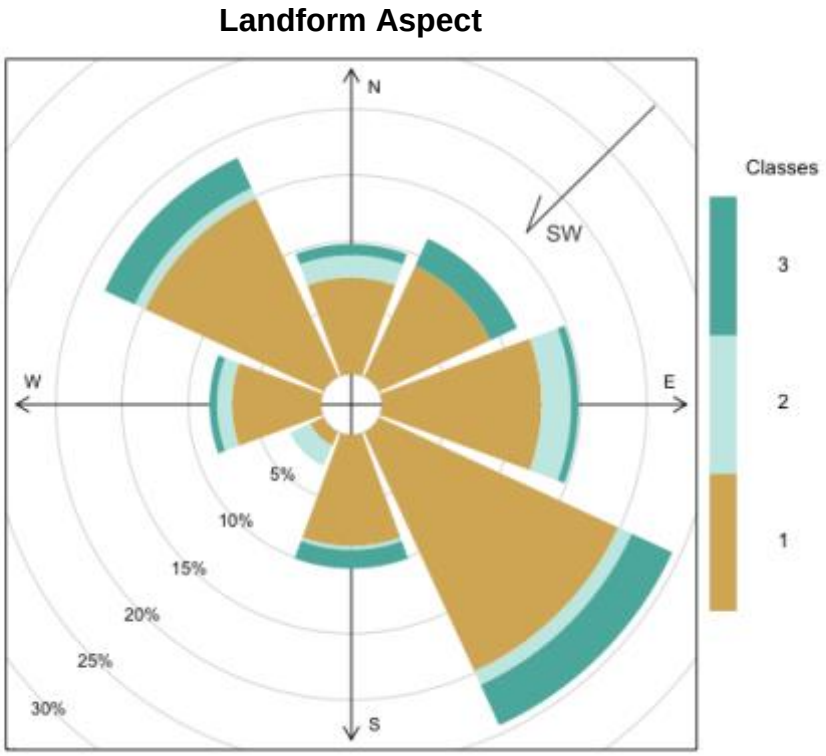

Figure 12. Directional graph of the hillslope aspect for all landforms and classes within the study area. The southwest pointing arrow indicates the dominant ice-flow direction in the region (Dredge et al., 1999).

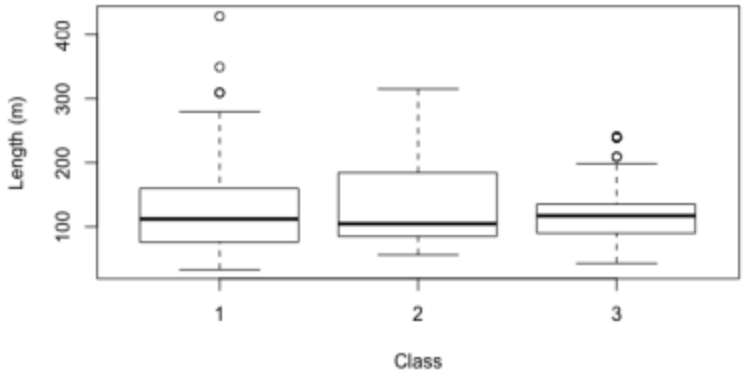

Figure 13. Boxplots of the total length of landforms according to class. A bolded line indicates the median value, the box extent indicates the interquartile range, the whiskers indicate minimum and maximum values with outliers removed, and circles indicate outliers.

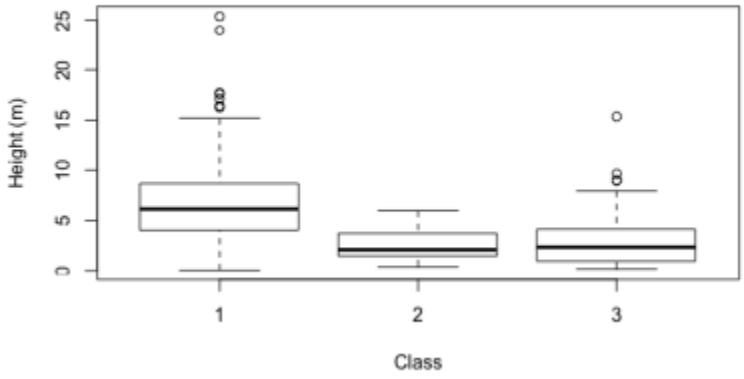

Figure 14. Boxplots of the total height of landforms from the footslope to the parent terrain separated by class. A bolded line indicates the median value, the box extent indicates the interquartile range, the whiskers indicate minimum and maximum values with outliers removed, and circles indicate outliers.

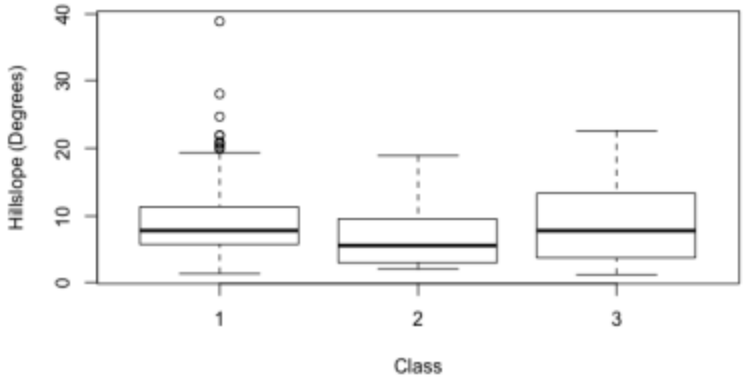

Figure 15. Boxplots of the hillslope angle, separated by class. A bolded line indicates the median value, the box extent indicates the interquartile range, the whiskers indicate minimum and maximum values with outliers removed, and circles indicate outliers.

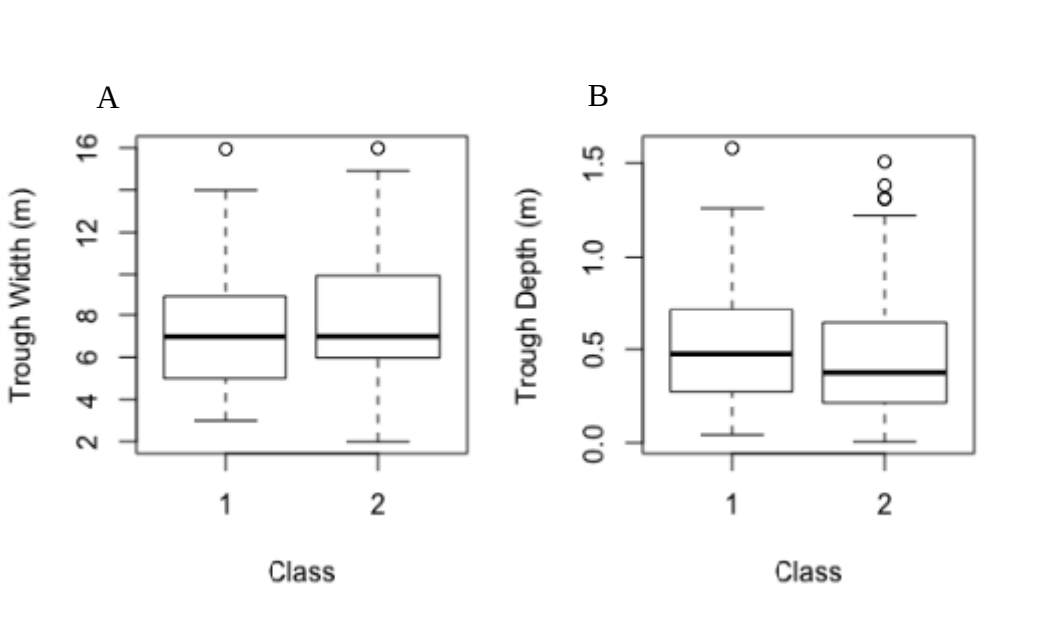

Figure 16. Boxplots of the trough dimension, separated by class, for (A) width and (B) depth. A bolded line indicates the median value, the box extent indicates the interquartile range, the whiskers indicate minimum and maximum values with outliers removed, and circles indicate outliers.

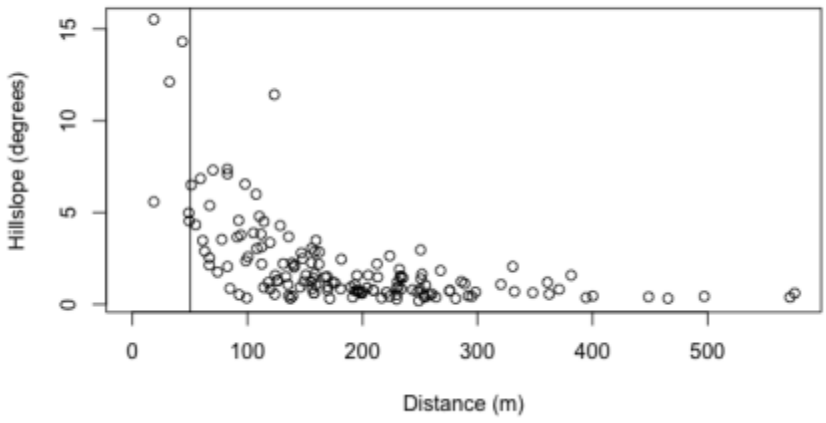

Figure 17. Hillslope angle versus distance from a waterbody for all profiles.

generally sparse vegetation on the slope of the hillslope, and the boulder lag at the footslope is nearly devoid of vegetation (Figure 7a). Due to the vegetation differences on the hillslope versus parent terrain, and the signs of creep and ground ice melting observed in the field in September 2015, this type is thought to be the most active.

Class 2 types are defined by a lack of parent terrain. They are thought to develop when two Class 1 landforms develop within close proximity, and therefore retrograde into each other over time. Class 2 landforms have two ridges, hill slopes, and footslopes, mirrored on either side of the trough; all pairs of morphological categories exhibit nearly identical values of elevation, slope and distance from the trough (Figure 8). Similar to Class 1, the densest vegetation is found within the trough, with vegetation becoming less abundant as distance from the trough increases (Figure 8a). The activity of this type is likely similar to Class 1 types.

The final Class 3 type is defined as having no trough but rather a symmetrical hill and footslope on either side of the ridge (Figure 9). Class 3 landforms can be found in the vicinity of clusters of Class 1 and 2 landforms. Class 3 types are surrounded on all sides by bouldery till blanket, with sparse vegetation found only on the ridge. This class is thought to be the final stage of a retrogressive process, having developed progressively from a Class 2 type, and is therefore thought to have the highest stability of all landform types.

4.2 Distribution

The surficial geology of this region is mainly bedrock, till, and unstratified materials (Figure 4), and the majority of the landforms are associated with hummocky till deposits (T3). These deposits are described as being from 5 to 30 m thick, forming irregular to rolling terrain with relief up to 15 m, with some areas having abundant small meltwater channels and lag concentrations of boulders in depressions. The landforms develop in hummocky till at the margins of boulder lag deposits, but it is not clear if the lag may be a product of the processes associated with landform development. What is clear is that most of the landforms mapped are not adjacent to a waterbody at present. However those that are have relatively greater local relief.

Morphologically, the landform classes have many similarities such as total length and hillslope angle, though the Class 1 types tend to exhibit greater total height than Class 2 or 3 types. Troughs evident behind and parallel to the hillslope on Class 1 and 2 have similar dimensions. The overall uniformity suggest that the assumption of classes relating to stages of the same process is likely correct. As the processes must be related to gradual permafrost change, and massive ice has been confirmed beneath at least one landform, present the lower height of Class 2 and 3 types may be related to melt of ground ice or distortional change as a result of creep. The average hillslope grade (8.98%) is significantly less than the degree of slope normally associated with the term hillslope. Though there are exceptions, overall these are comparatively gentle landforms with minimal total change in elevation.

4.3 Geomorphological Process

As far as we know, the general geomorphology of these landforms is unlike any other yet described in the literature for this region. Though the landforms in the Lac de Gras area appear to have a retrogressive component, are curvilinear in plan-view, and appear to

incise parent terrain from multiple aspects, they are unlike retrogressive thaw slumps because they do not appear to require adjacency to a water body for formation, they frequently have a characteristic trough behind and parallel to the upper rim of the hillslope, and there is no evidence of debris flow. However, as with retrogressive thaw slumps, it may be that the development of the landforms mapped herein is associated with massive ice as indicated by 1 borehole drilled in hummocky till.

The development of these landforms may instead be related to creep of the diamicton of the parent terrain. Soil creep is evident in the field at some hillslopes (Figure 2f), and the set of landforms identified herein bear a striking resemblance to the ice-rich involuted hills near Tuktoyaktuk (Figure 3b). The creep of frozen ground may occur with concurrent permafrost degradation at the margins of the ice-rich till deposits as suggested by the change in overall elevation from the parent terrain height to the base of the footslope, and also by the elevational sorting of surficial materials. Frost jacking of boulders is common at the surface of the parent material (E.g., Figure 2g), and the larger clasts near the ridge may fall to the base of the hillslope when undercut by the movement of the finer-grained materials. This may then lead to the ubiquitous boulder lag type terrain at the footslopes of the mapped features (e.g., Figure 2e). As there are no other clear mechanisms to remove earth materials from the vicinity of the landforms as with debris flows on retrogressive thaw slumps, the change in overall elevation may be due to ground ice melt beneath the hillslope. Ground ice thaw may also explain the common observation of water ponding in what appear to be thermokarst pits, some with suspended sediments, despite the low summer precipitation (e.g., Figure 2h).

The mechanism responsible for the development of the troughs remains unknown. It is likely related to differential creep and is not related to ice wedge formation or degradation. The average width of the trough (~7.7 m) is much greater than the average width of an epigenetic ice wedge (2-3 m), and the data collected from the single borehole (RC15-150) suggests that the thickness of massive ice beneath the trough is on the order of 10's of metres, much greater than the average 3 – 4 m thickness of ice associated with epigenetic ice wedges. In light of the observations and analysis at hand, the landforms studied herein are tentatively termed retrogressive creeping slumps.

4.4 Importance

Retrogressive creeping slumps have a unique geomorphology, this alone makes them an important feature in this landscape. If they are indeed a function of creep with a retrogressive component, they may share similar traits with the involuted hills terrain near Tuktoyaktuk, and correspondingly may have a possible relationship with ice at depth. Understanding whether or not this relationship exists is important because if the relationship is valid, these landforms would provide a surficial indicator for the presence of ice at depth associated with hummocky till (T3) deposits. In addition, a better understanding of the relationship between retrogressive creeping slump and massive ice would also aid in the understanding of the potential effects of climate change on these features.

Of note, the dominant aspect of retrogressive creeping slump found in this region (Figure 12) suggests possible influence from the last glaciation. The dominant direction of the scarp is southwest, perpendicular to the historical ice flow direction in this region.

4.5 Future Considerations

Continuing to monitor these features would allow for a better understanding of their geomorphological processes and their time progression. Retrogressive creeping slumps are thought to have a slow time transgressive component, evolving through three distinct stages. The common observation soil creep (Figure 2f) suggests that they are in fact slow mass wasting events. However, to able to indicate this with any degree of certainty, detailed site investigations of processes and ground materials are necessary. Continued research focused on the stratigraphy and thermal regime of these features, combined with process investigation and modelling would allow for a more robust data set and potentially more meaningful results. The addition of this data, and continued observation, would also aid in understanding the potential effects of climate change on retrogressive creeping slumps.

5 SUMMARY AND CONCLUSIONS

This Open File Report examines geomorphological elements of a periglacial landform newly identified in the Lac de Gras region, Northwest Territories. LiDAR and derived data sets are used along with aerial photographs in a terrain analysis scheme to identify the landforms and quantify landform metrics. Raw data, extracted metrics, and summary tables are presented in Appendices A, B, and C, respectively. In total, 152 landforms are mapped within the study area. A classification scheme is proposed to capture time-transgressive change thought to occur with the landform evolution: Class 1 – early-stage; Class 2 – late-stage, composite feature; Class 3 – final-stage, remnant feature. The majority of the mapped landforms are Class 1 type and occur in hummocky till. The landforms are commonly recognized by a characteristic trough situated a few metres behind, and parallel to the curvilinear headwall. The origin of the troughs is not clear, but they are not likely related to ice-wedge development or degradation.

The features investigated here are tentatively termed retrogressive creeping slumps, and are thought to develop from a composite of slow mass wasting processes predominantly driven by creep of frozen ground. Much more work needs to be done to better understand the geomorphological processes involved with their development, the time frame under which this occurs, their geographic extent in the North, and their potential correlation to the location of massive ground ice. This alone makes them important as there are significant implications for infrastructure development activities in this diamond-rich region, and for deglaciation models for landscape evolution.

ACKNOWLEDGEMENTS

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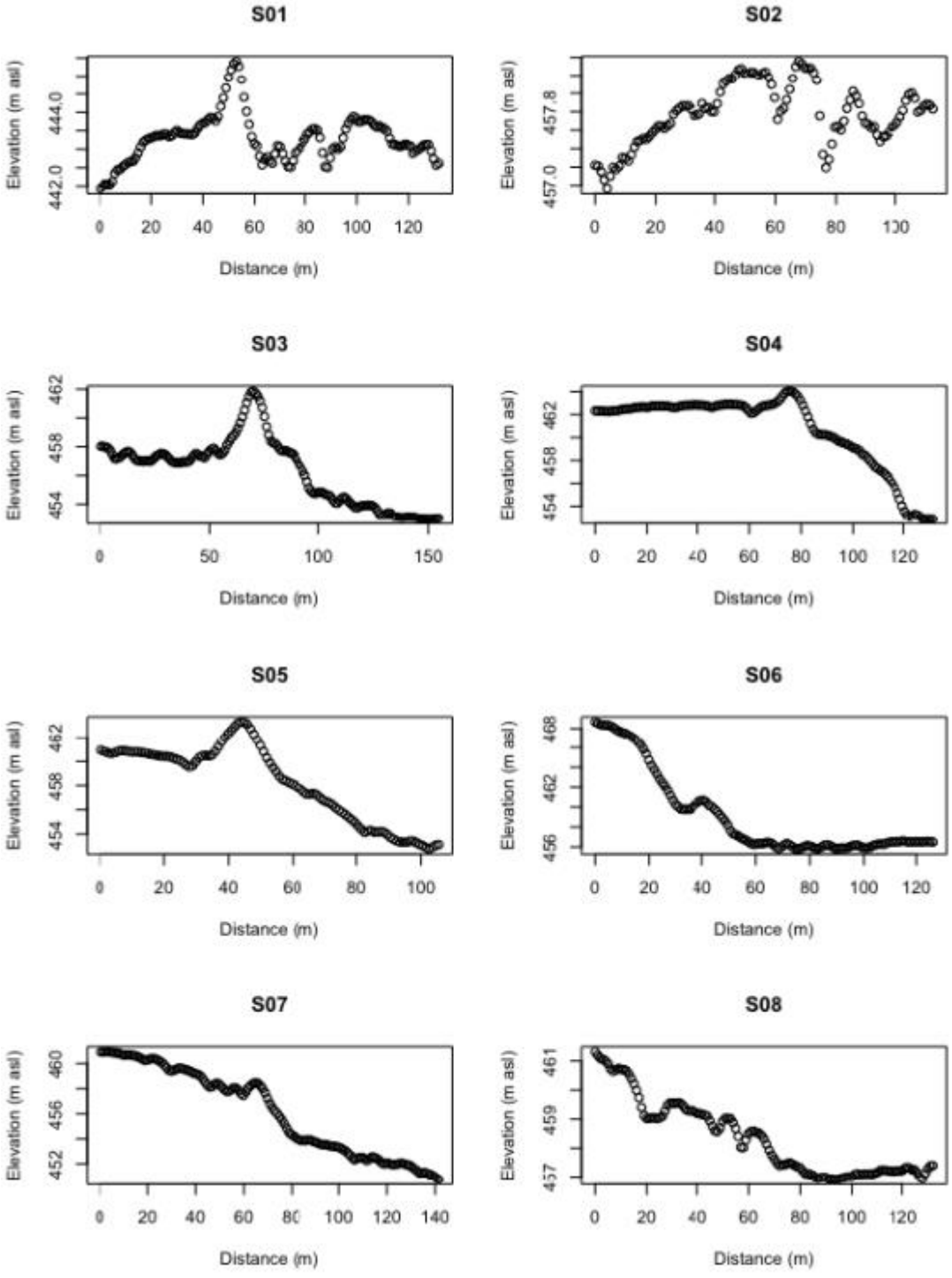
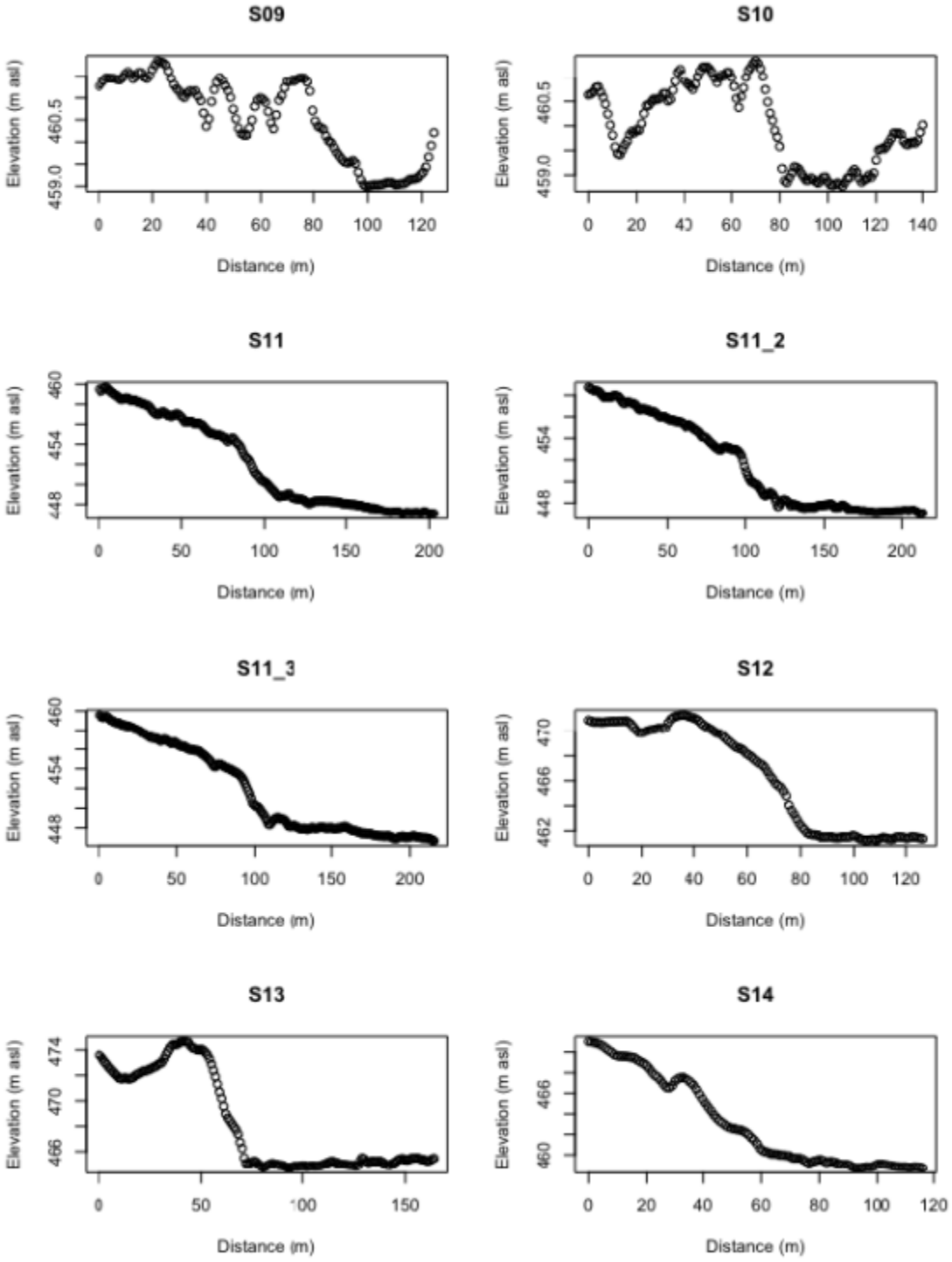
APPENDIX A – ELEVATION PROFILES

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Distance (m)
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Elevation (m asl)
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454
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150
200
Distance (m)
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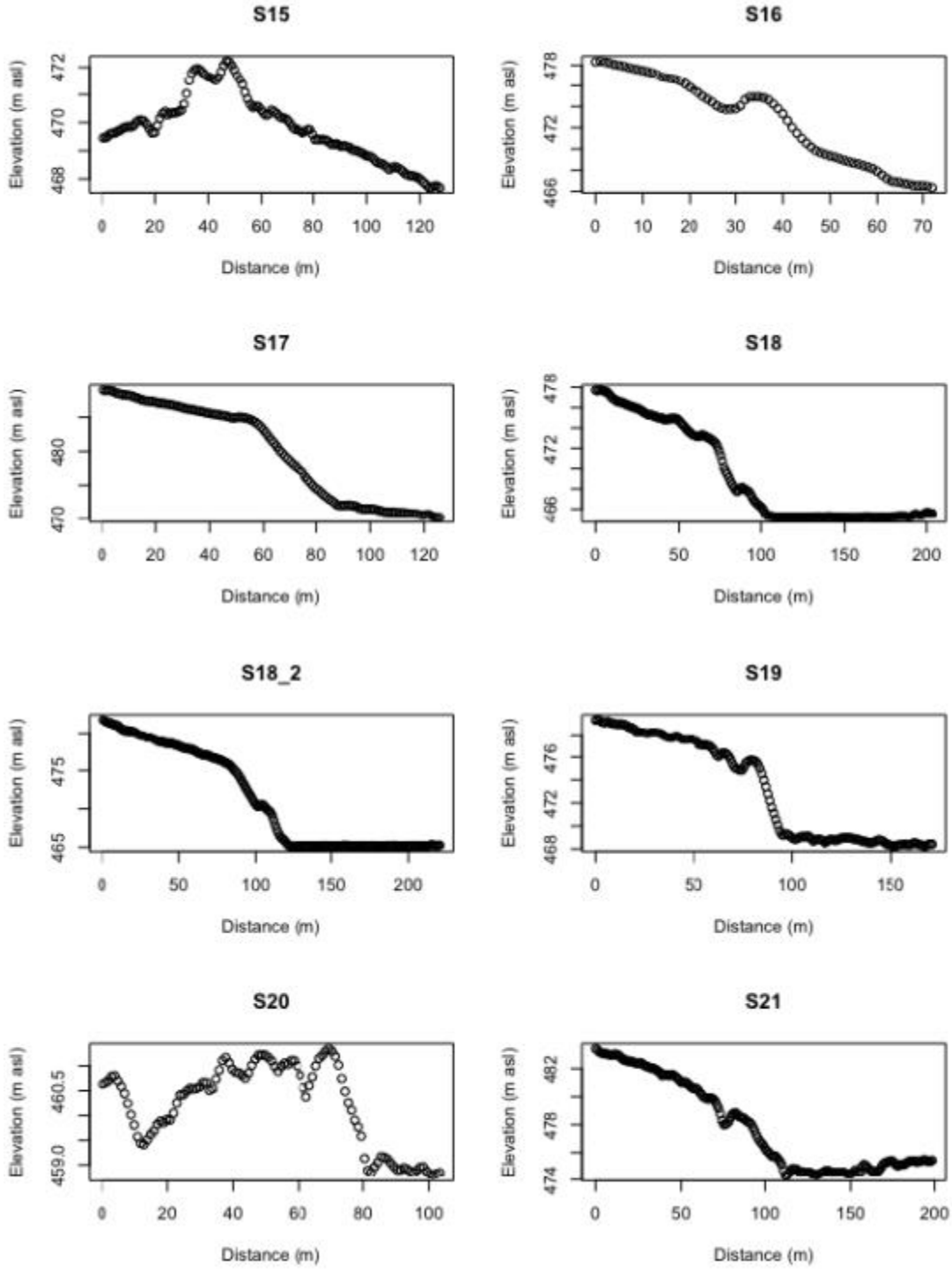
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150
Distance (m)
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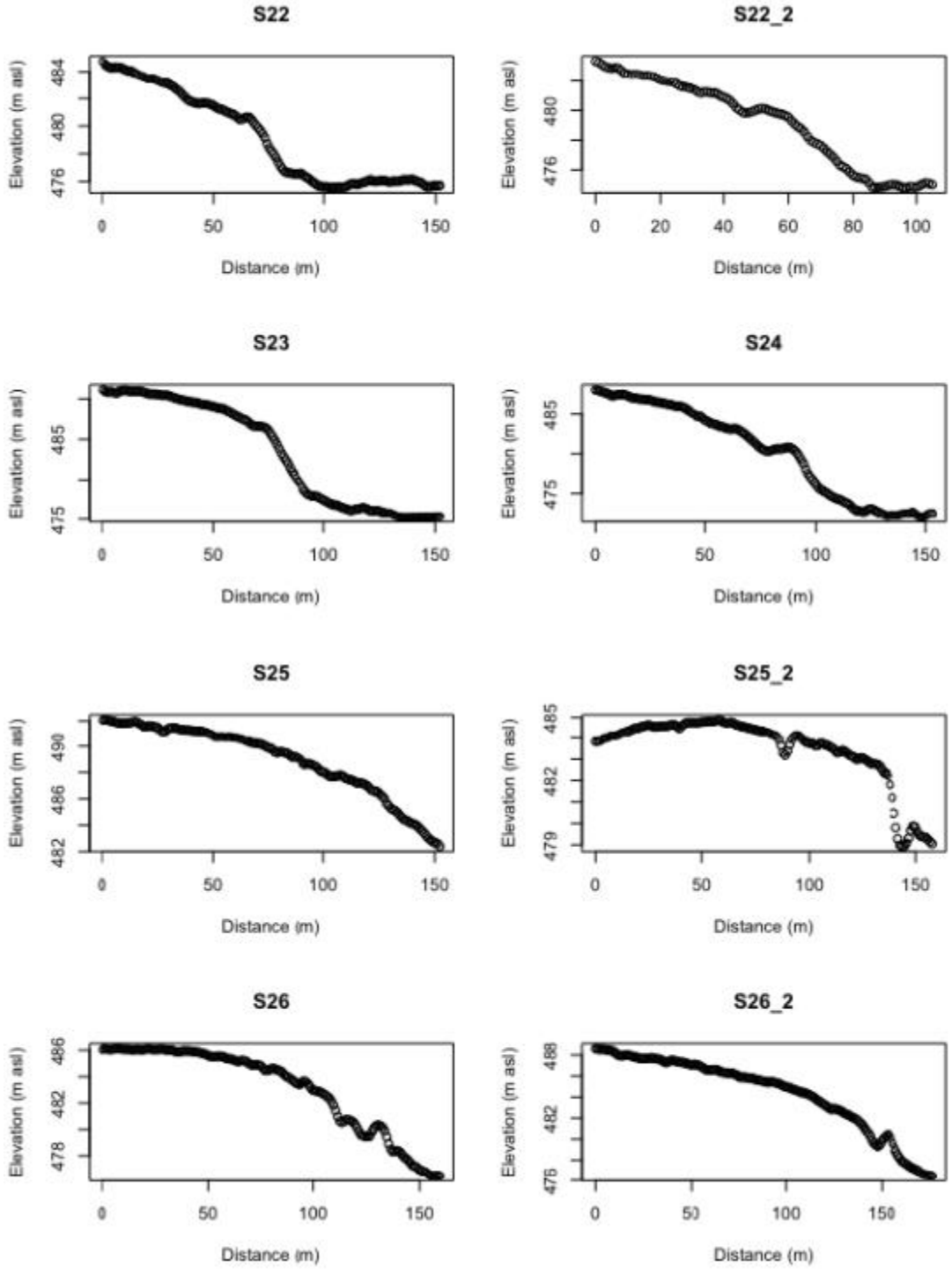
Distance (m)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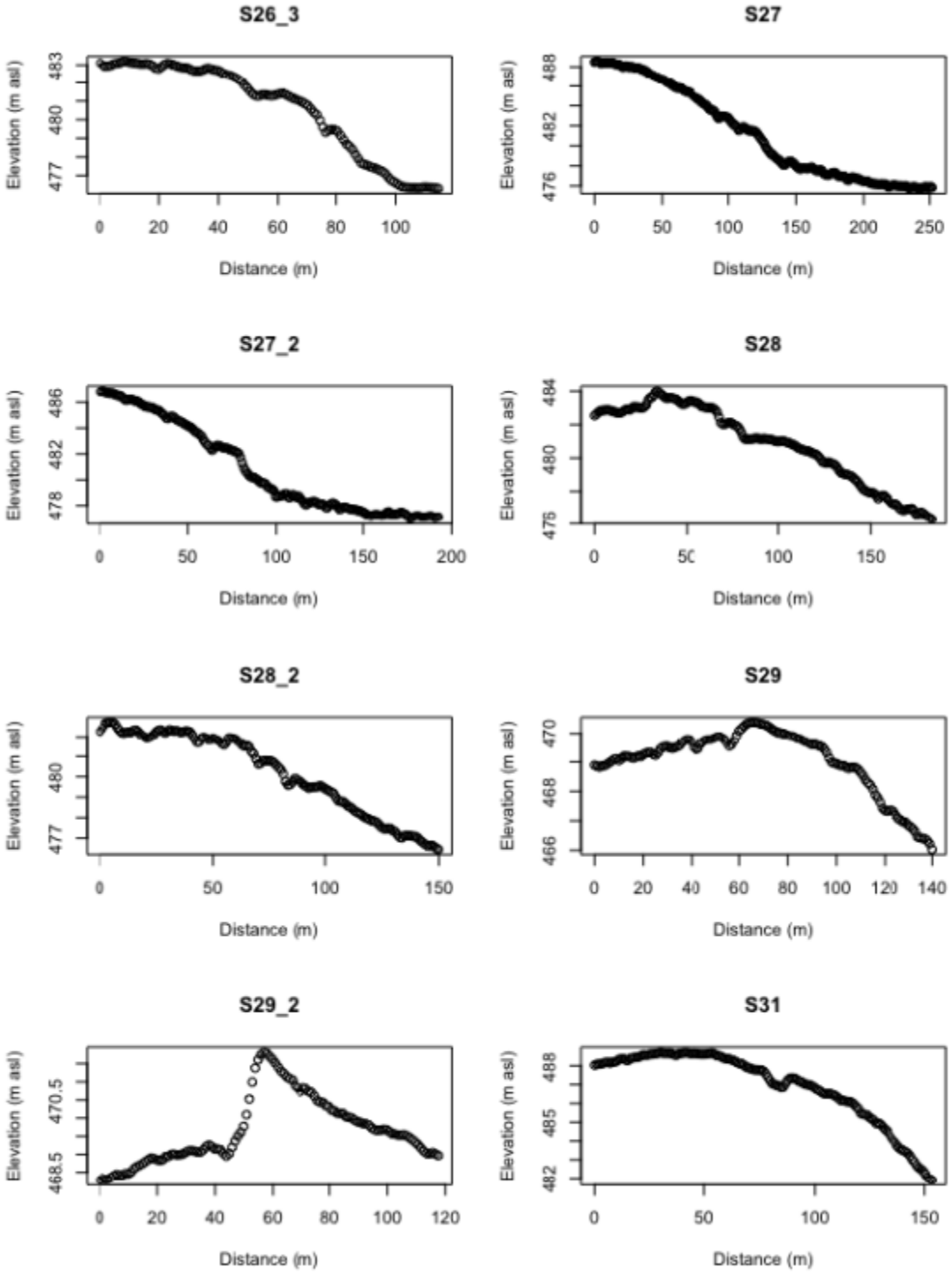
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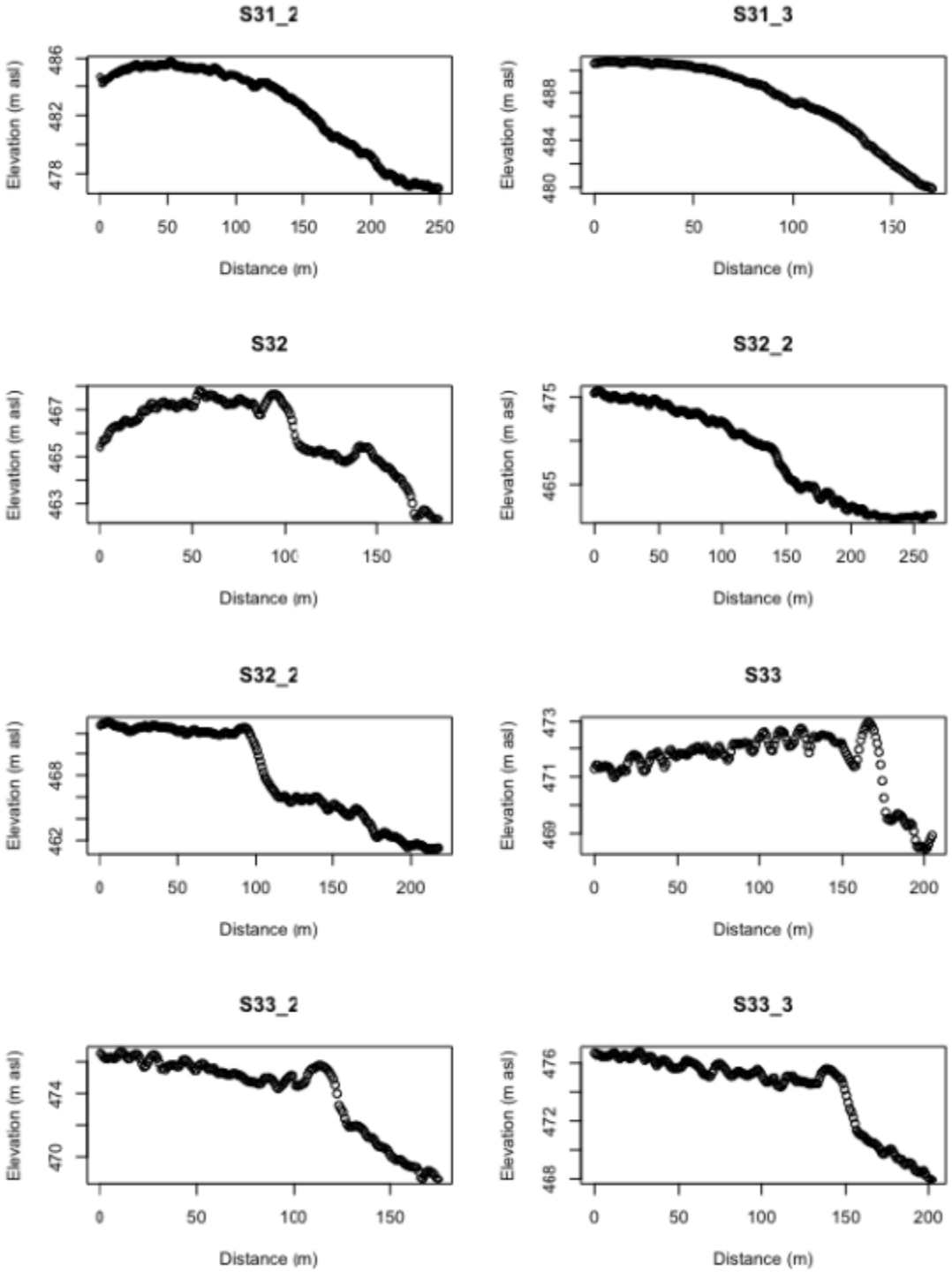
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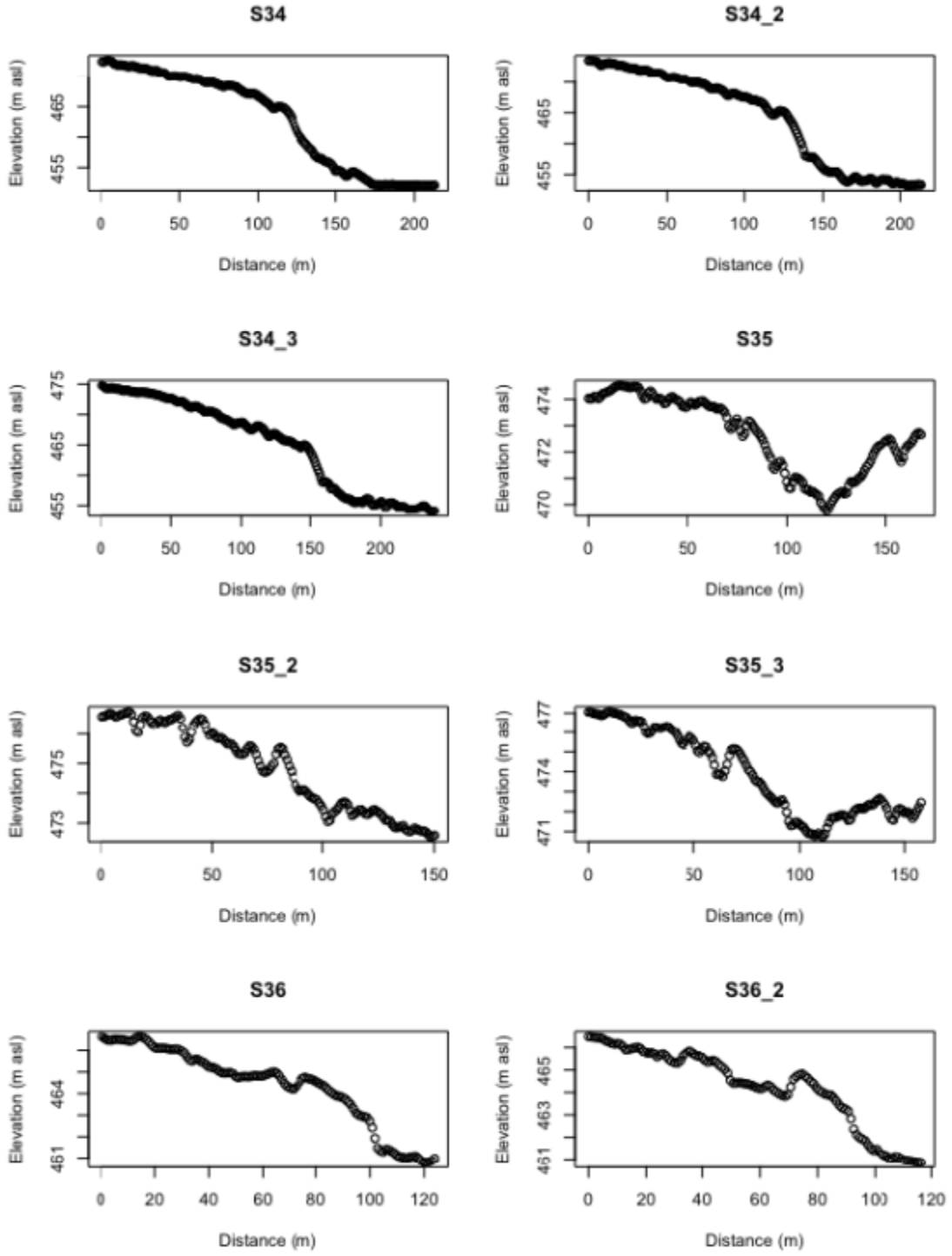
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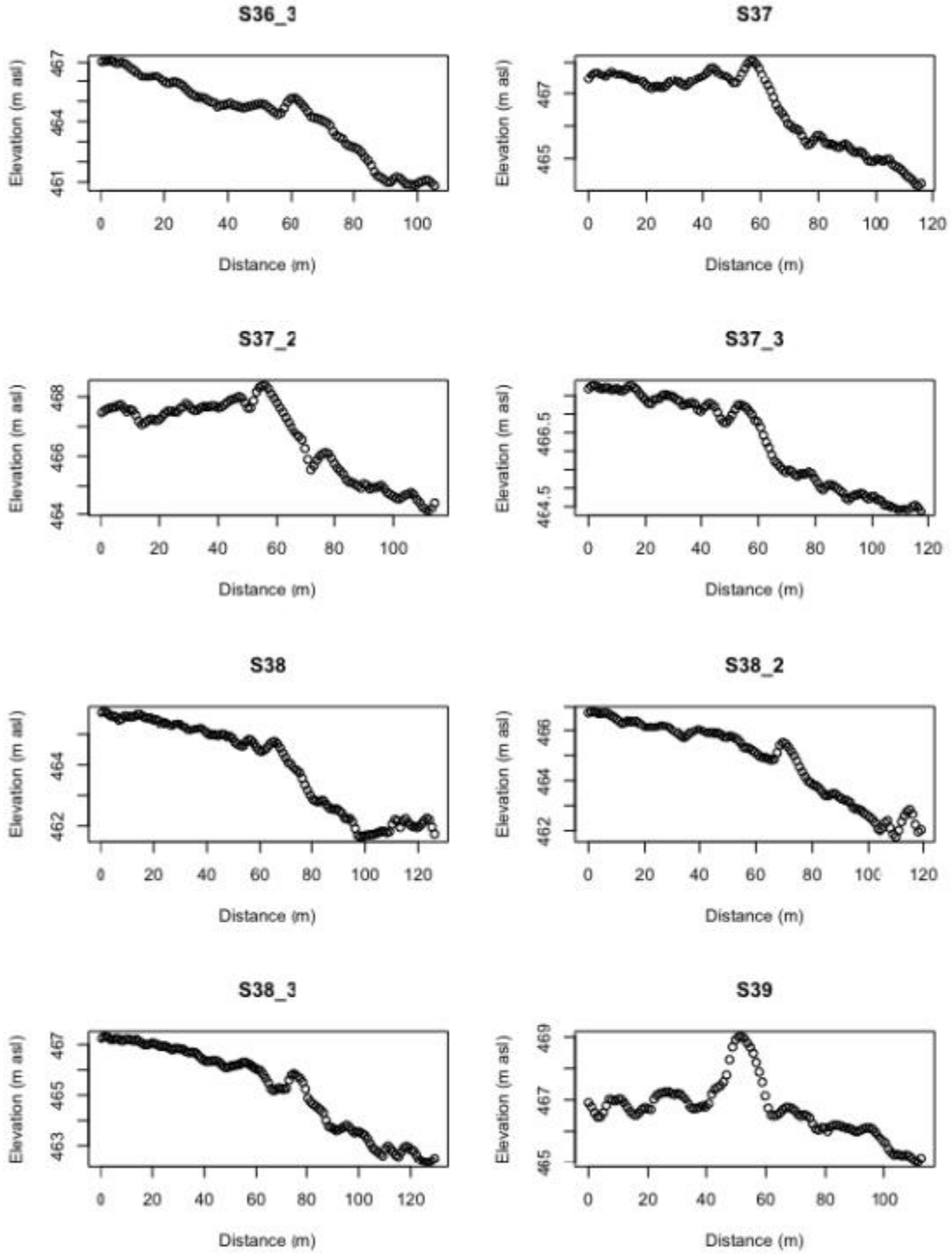
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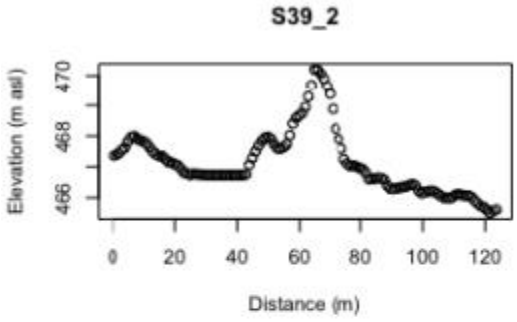
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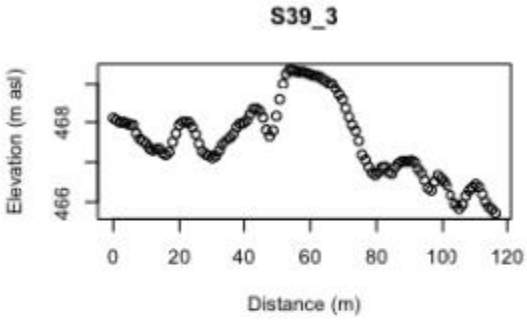
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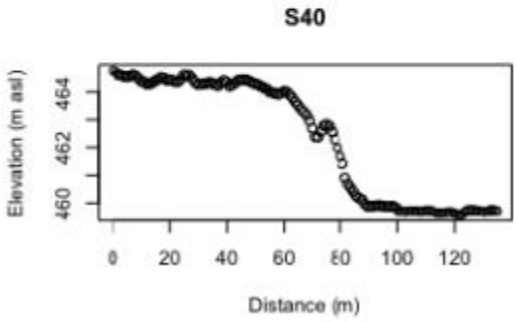
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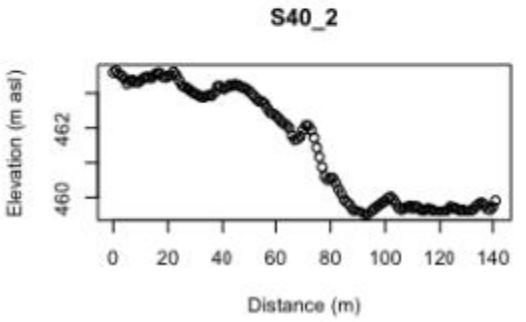
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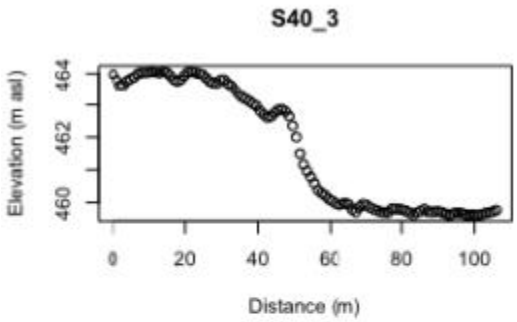
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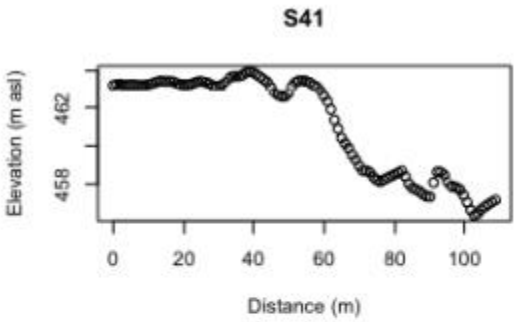
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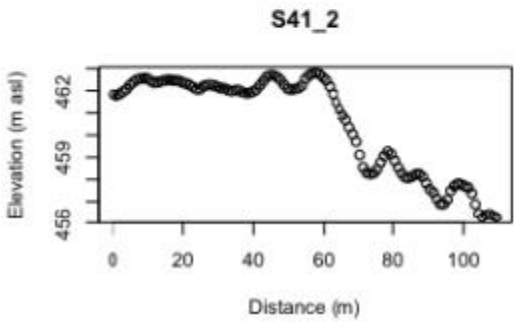
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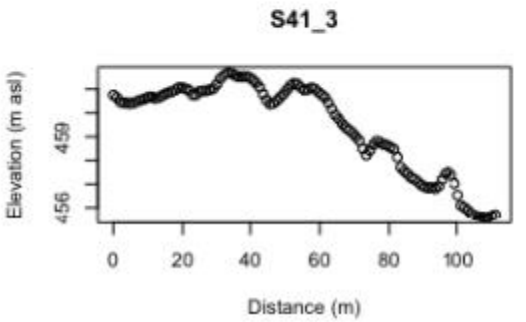
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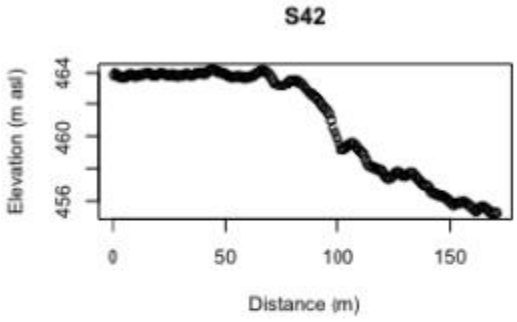
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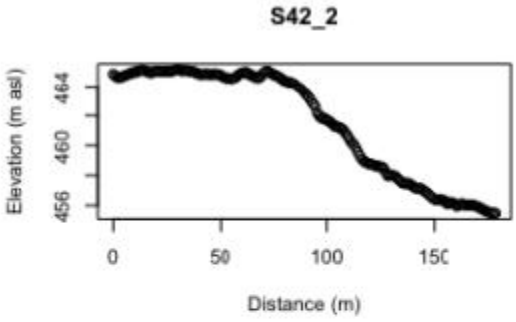
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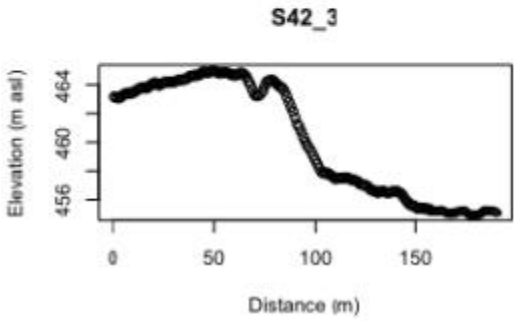
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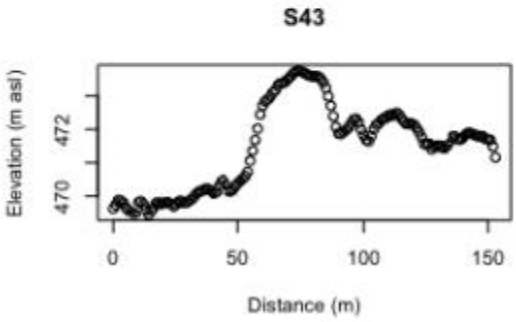
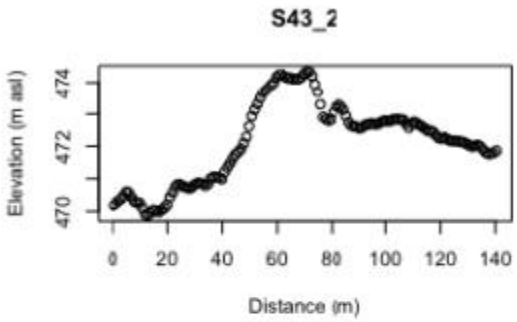
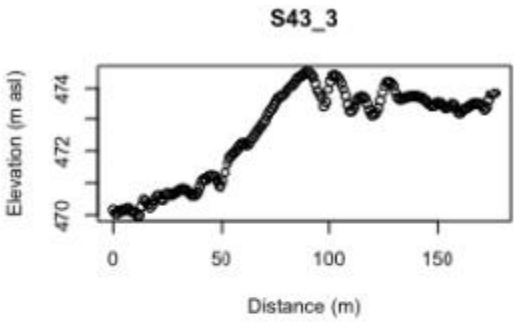
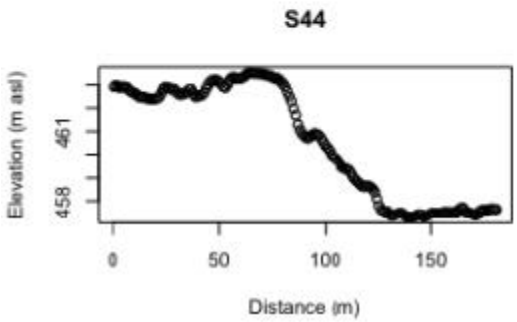
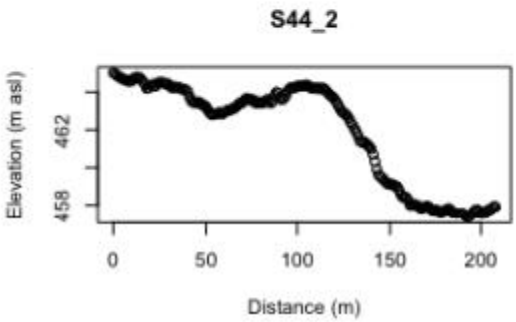
150
Distance (m)

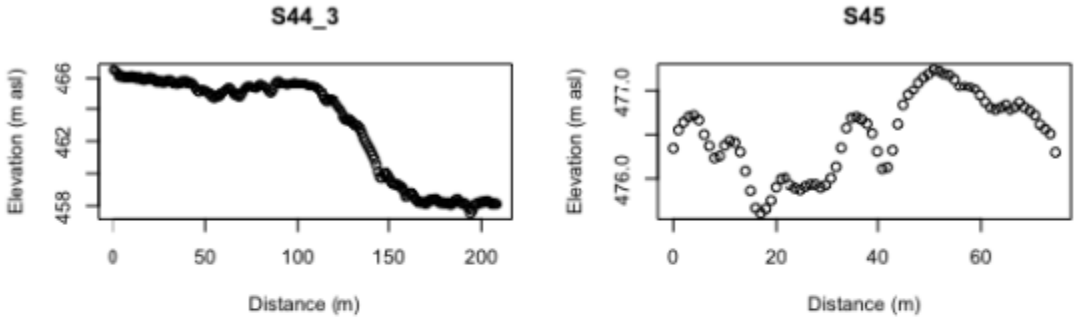

S43
Elevation (m asl)
470
472
0
50
100
150
Distance (m)


S43_2
Elevation (m asl)
470
472
474
0
20
40
60
80
100
120
140
Distance (m)

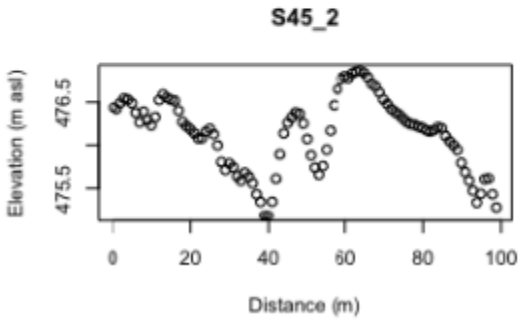

S43_3
Elevation (m asl)
470
472
474
0
50
100
150
Distance (m)

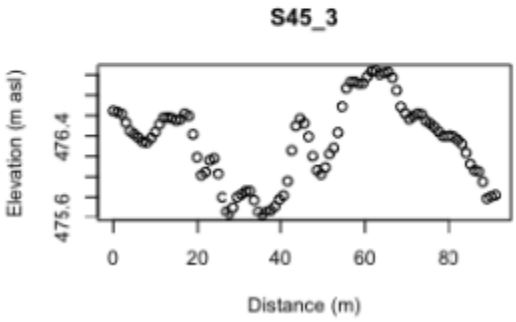

S44
Elevation (m asl)
458
461
0
50
100
150
Distance (m)

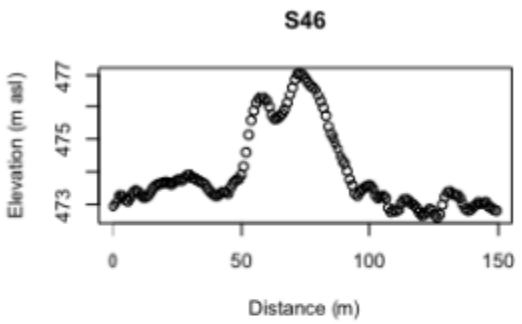

S44_2
Elevation (m asl)
458
462
0
50
100
150
200
Distance (m)

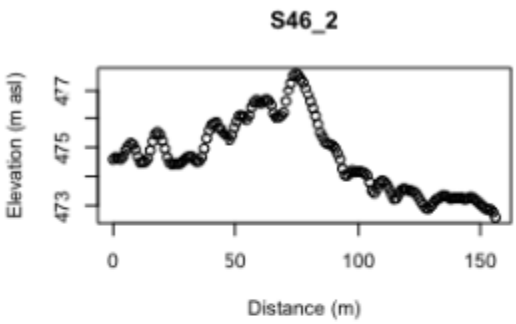

S44_3
Elevation (m asl)
458
462
466
0
50
100
150
200
Distance (m)

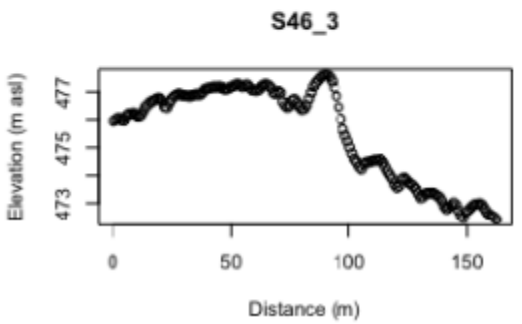
S45
Elevation (m asl)
476.0
477.0
0
20
40
60
Distance (m)

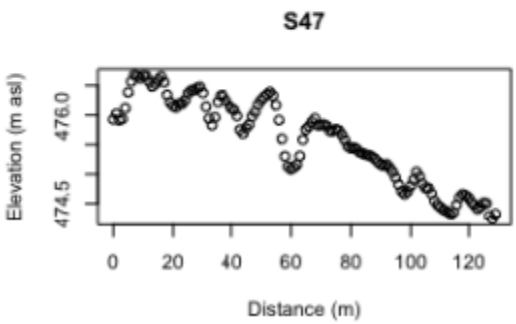

S45_2
Elevation (m asl)
475.5
476.5
0
20
40
60
80
100
Distance (m)

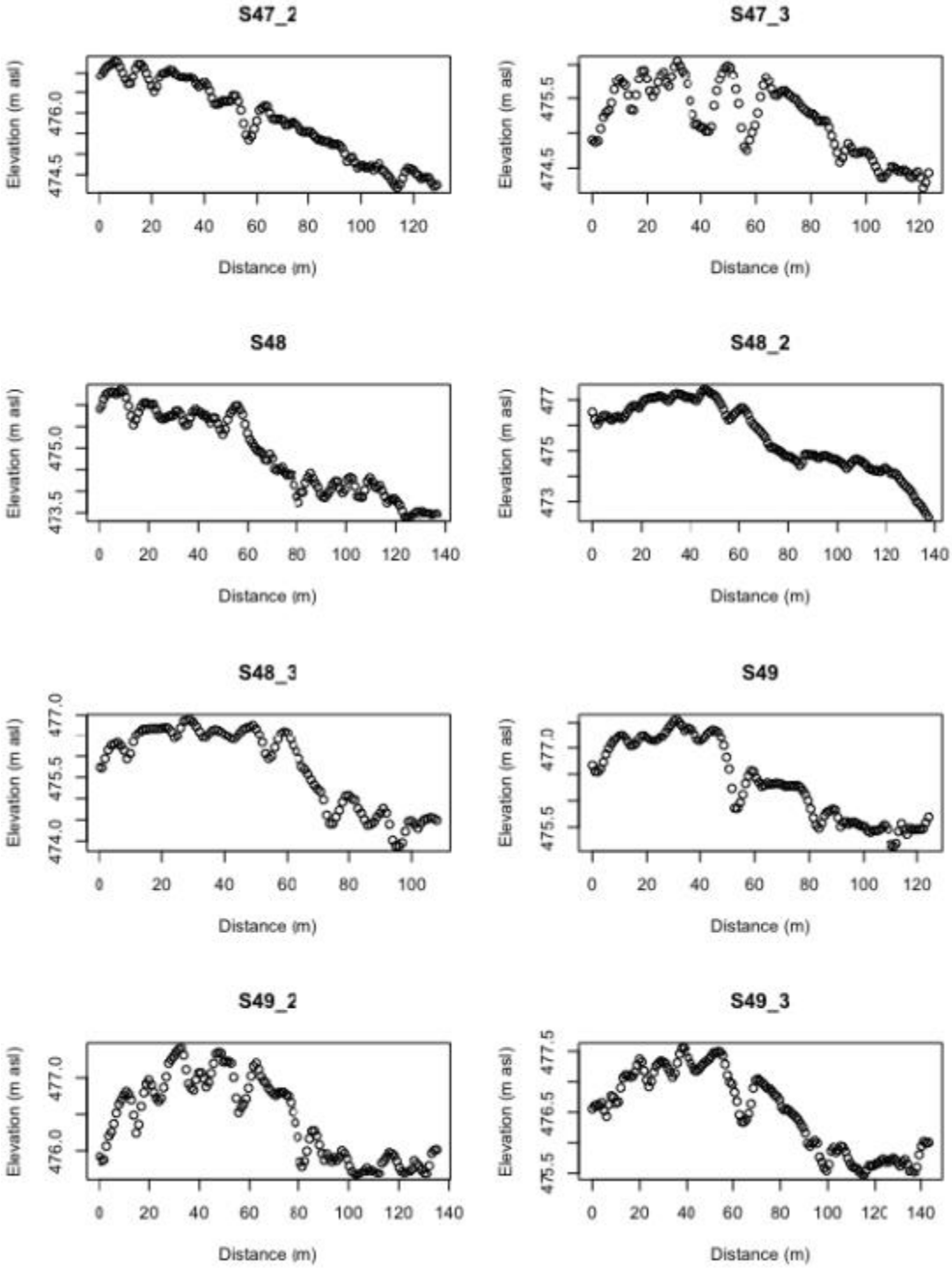

S45_3
Elevation (m asl)
475.6
476.4
0
20
40
60
80
Distance (m)

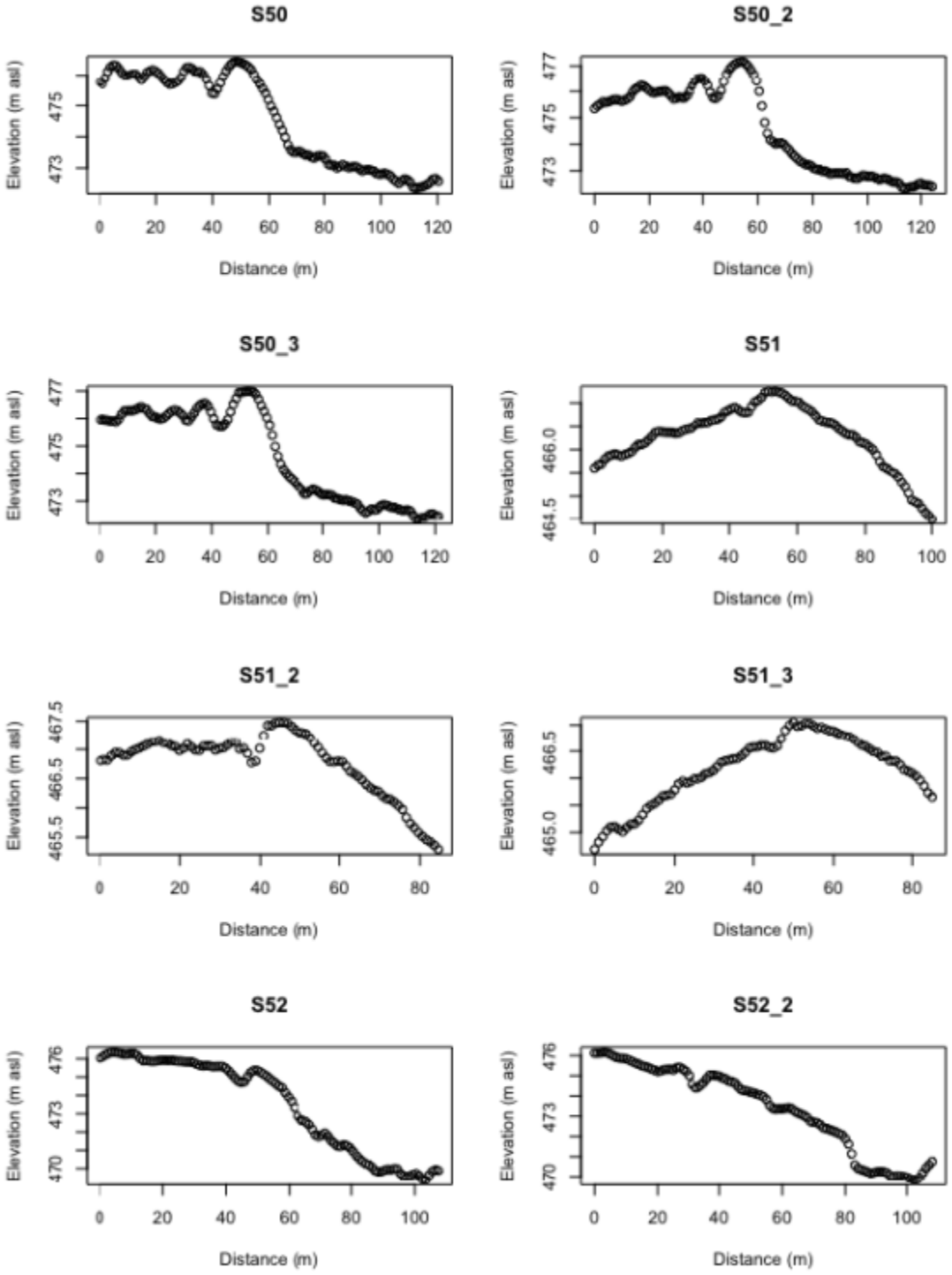

S46
Elevation (m asl)
473
475
477
0
50
100
150
Distance (m)

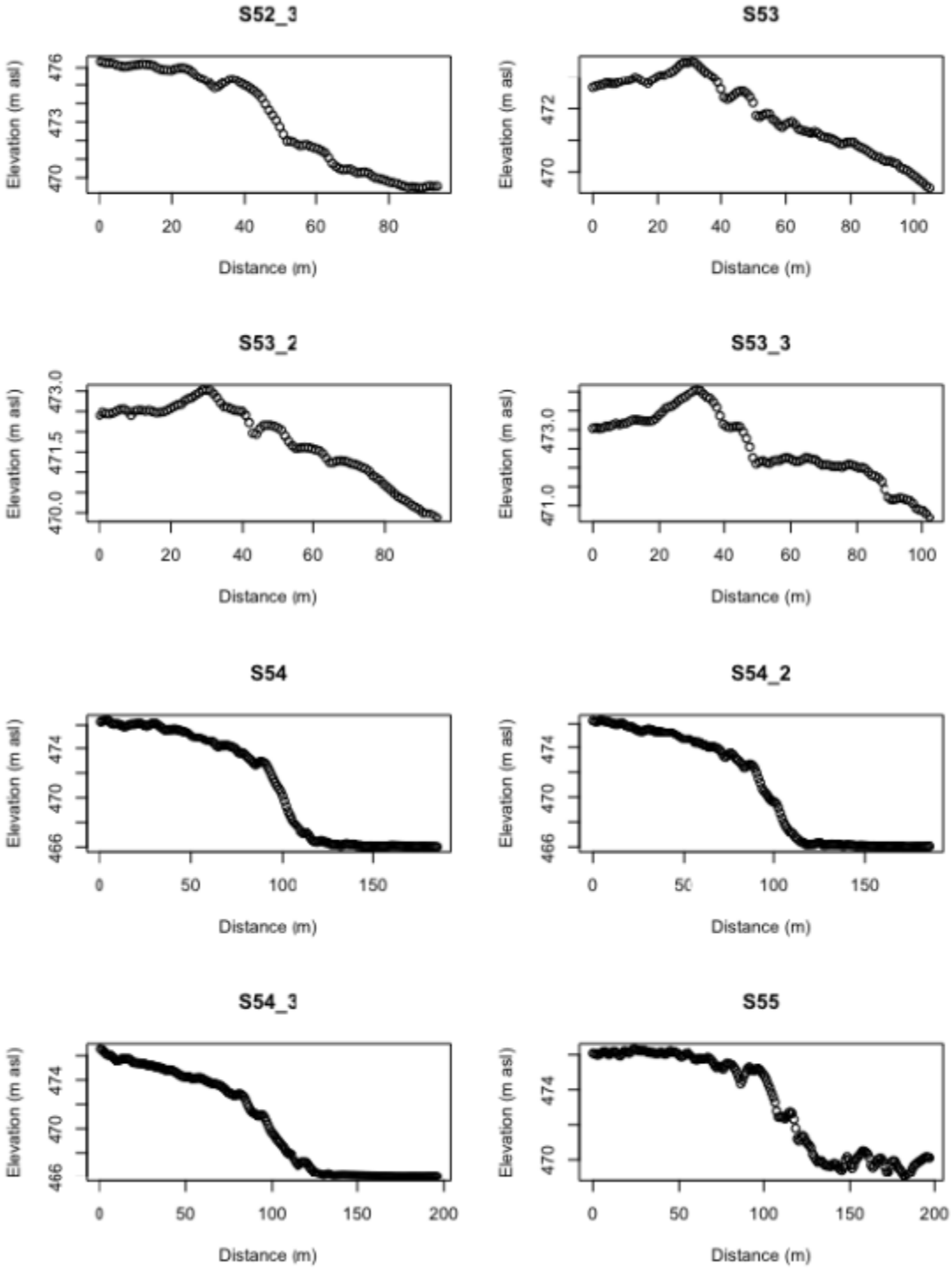

S46_2
Elevation (m asl)
473
475
477
0
50
100
150
Distance (m)

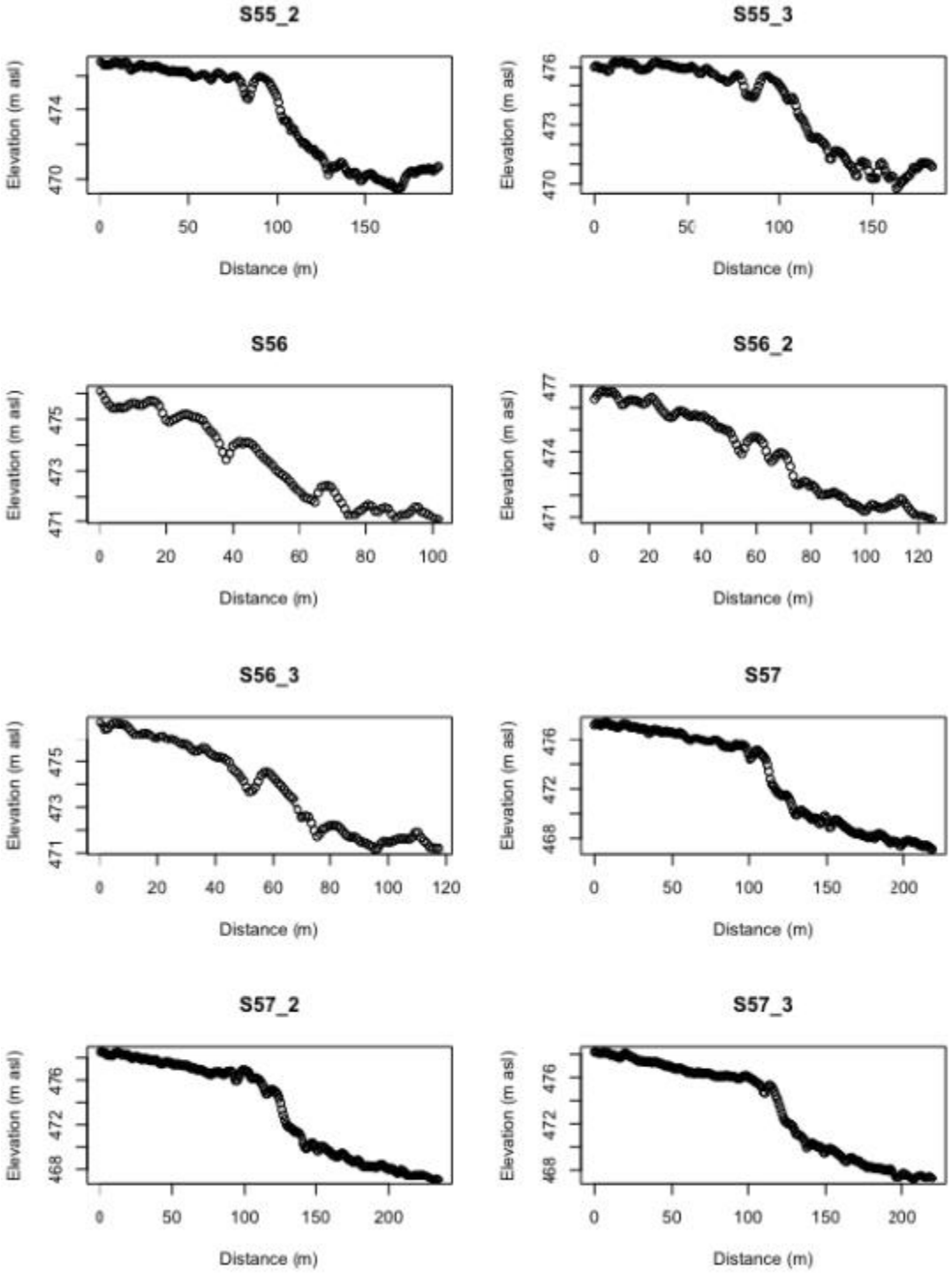

S46_3
Elevation (m asl)
473
475
477
0
50
100
150
Distance (m)

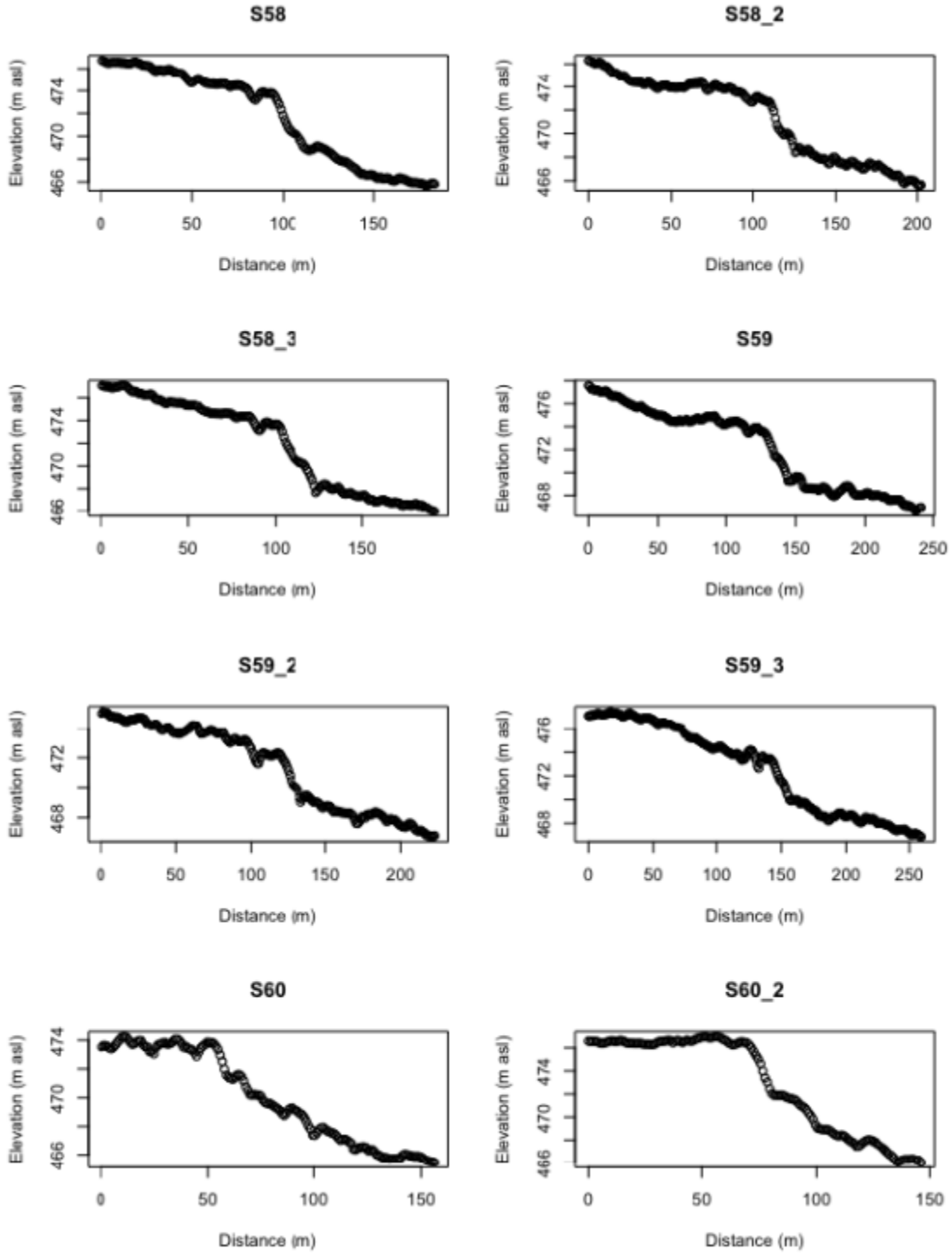

S47
Elevation (m asl)
474.5
476.0
0
20
40
60
80
100
120
Distance (m)

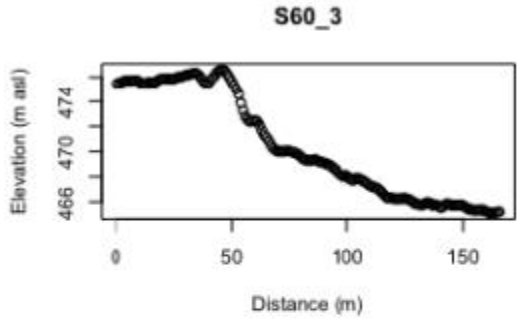

S47_2
Elevation (m asl)
474.5
476.0
0
20
40
60
80
100
120
Distance (m)
S47_3
Elevation (m asl)
474.5
475.5
0
20
40
60
80
100
120
Distance (m)
S48
Elevation (m asl)
473.5
475.0
0
20
40
60
80
100
120
140
Distance (m)
S48_2
Elevation (m asl)
473
475
477
0
20
40
60
80
100
120
140
Distance (m)
S48_3
Elevation (m asl)
474.0
475.5
477.0
0
20
40
60
80
100
Distance (m)
S49
Elevation (m asl)
475.5
477.0
0
20
40
60
80
100
120
Distance (m)
S49_2
Elevation (m asl)
476.0
477.0
0
20
40
60
80
100
120
140
Distance (m)
S49_3
Elevation (m asl)
475.5
476.5
477.5
0
20
40
60
80
100
120
140
Distance (m)

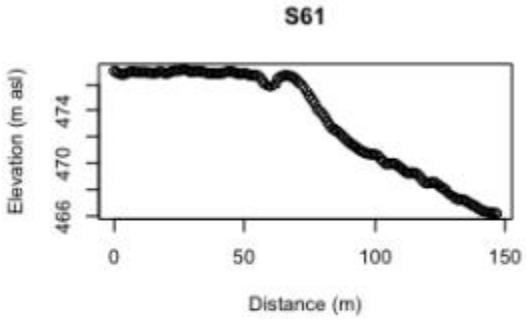

S50
Elevation (m asl)
473
475
0
20
40
60
80
100
120
Distance (m)
S50_2
Elevation (m asl)
473
475
477
0
20
40
60
80
100
120
Distance (m)
S50_3
Elevation (m asl)
473
475
477
0
20
40
60
80
100
120
Distance (m)
S51
Elevation (m asl)
464.5
466.0
0
20
40
60
80
100
Distance (m)
S51_2
Elevation (m asl)
465.5
466.5
467.5
0
20
40
60
80
Distance (m)
S51_3
Elevation (m asl)
465.0
466.5
0
20
40
60
80
Distance (m)
S52
Elevation (m asl)
470
473
476
0
20
40
60
80
100
Distance (m)
S52_2
Elevation (m asl)
470
473
476
0
20
40
60
80
100
Distance (m)

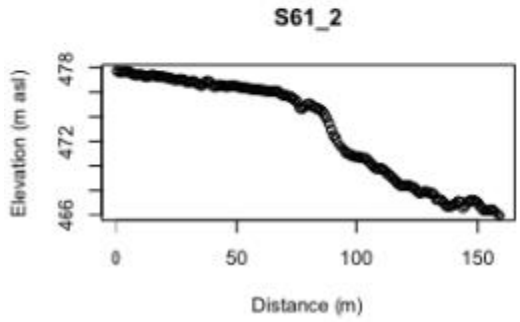

S52_3
Elevation (m asl)
470
473
476
0
20
40
60
80
Distance (m)
S53
Elevation (m asl)
470
472
0
20
40
60
80
100
Distance (m)
S53_2
Elevation (m asl)
470.0
471.5
473.0
0
20
40
60
80
Distance (m)
S53_3
Elevation (m asl)
471.0
473.0
0
20
40
60
80
100
Distance (m)
S54
Elevation (m asl)
466
470
474
0
50
100
150
Distance (m)
S54_2
Elevation (m asl)
466
470
474
0
50
100
150
Distance (m)
S54_3
Elevation (m asl)
466
470
474
0
50
100
150
200
Distance (m)
S55
Elevation (m asl)
470
474
0
50
100
150
200
Distance (m)

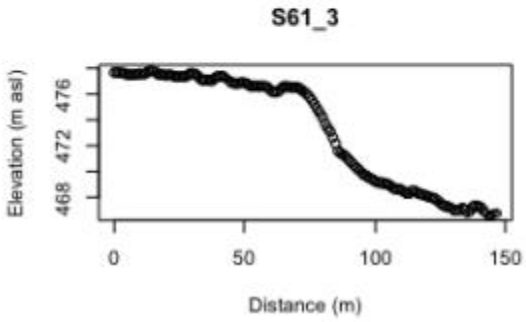

S55_2
Elevation (m asl)
470
474
0
50
100
150
Distance (m)
S55_3
Elevation (m asl)
470
473
476
0
50
100
150
Distance (m)
S56
Elevation (m asl)
471
473
475
0
20
40
60
80
100
Distance (m)
S56_2
Elevation (m asl)
471
474
477
0
20
40
60
80
100
120
Distance (m)
S56_3
Elevation (m asl)
471
473
475
0
20
40
60
80
100
120
Distance (m)
S57
Elevation (m asl)
468
472
476
0
50
100
150
200
Distance (m)
S57_2
Elevation (m asl)
468
472
476
0
50
100
150
200
Distance (m)
S57_3
Elevation (m asl)
468
472
476
0
50
100
150
200
Distance (m)

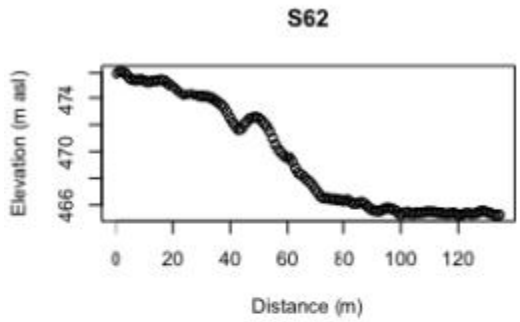

S58
Elevation (m asl)
466
470
474
0
50
100
150
Distance (m)
S58_2
Elevation (m asl)
466
470
474
0
50
100
150
200
Distance (m)
S58_3
Elevation (m asl)
466
470
474
0
50
100
150
Distance (m)
S59
Elevation (m asl)
468
472
476
0
50
100
150
200
250
Distance (m)
S59_2
Elevation (m asl)
468
472
0
50
100
150
200
Distance (m)
S59_3
Elevation (m asl)
468
472
476
0
50
100
150
200
250
Distance (m)
S60
Elevation (m asl)
466
470
474
0
50
100
150
Distance (m)
S60_2
Elevation (m asl)
466
470
474
0
50
100
150
Distance (m)

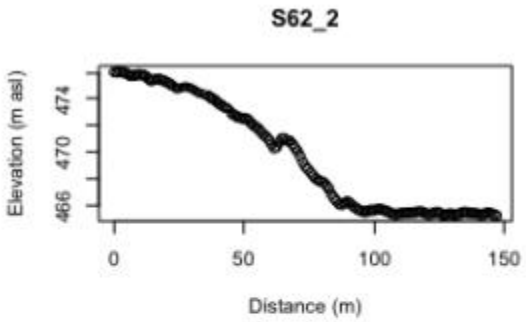

S60_3
Elevation (m asl)
466
470
474
0
50
100
150
Distance (m)

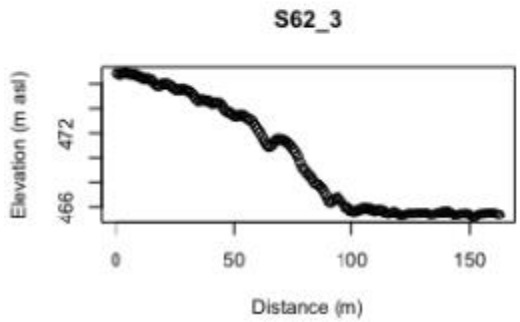

S61
Elevation (m asl)
466
470
474
0
50
100
150
Distance (m)

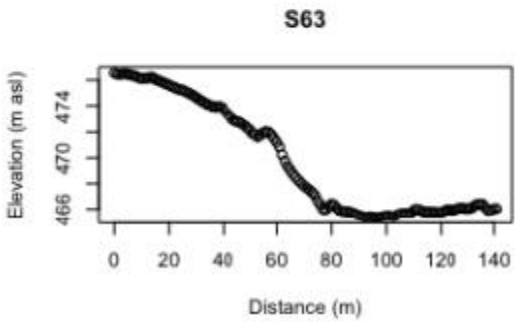

S61_2
Elevation (m asl)
466
472
478
0
50
100
150
Distance (m)

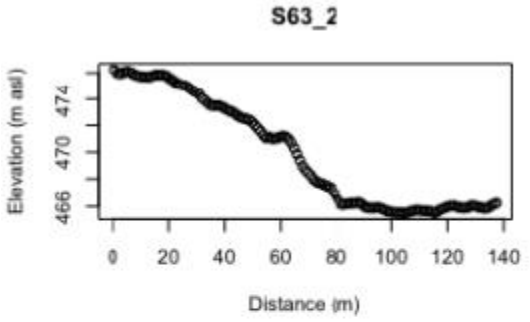

S61_3
Elevation (m asl)
468
472
476
0
50
100
150
Distance (m)

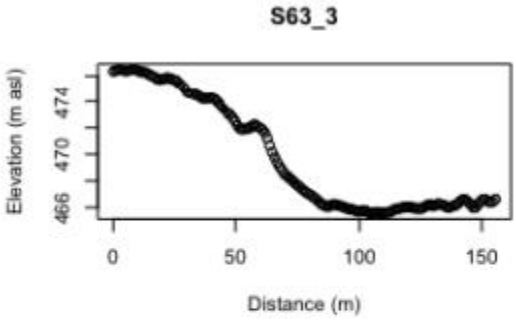

S62
Elevation (m asl)
466
470
474
0
20
40
60
80
100
120
Distance (m)

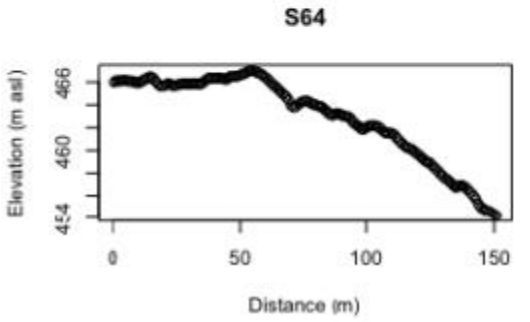

S62_2
Elevation (m asl)
466
470
474
0
50
100
150
Distance (m)

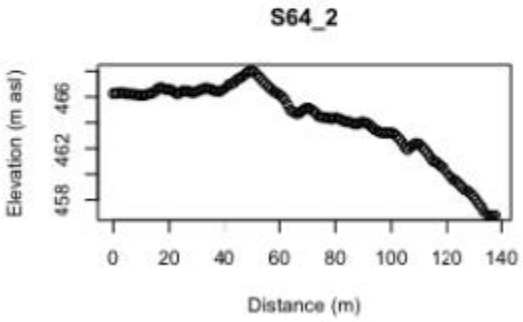

S62_3
Elevation (m asl)
466
472
0
50
100
150
Distance (m)

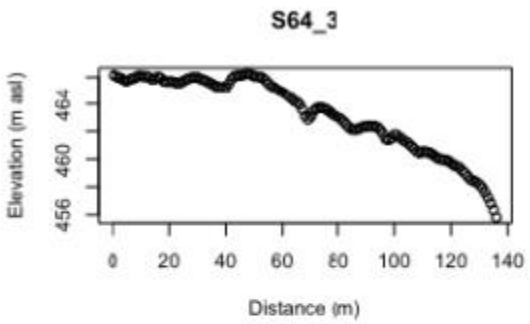

S63
Elevation (m asl)
466
470
474
0
20
40
60
80
100
120
140
Distance (m)

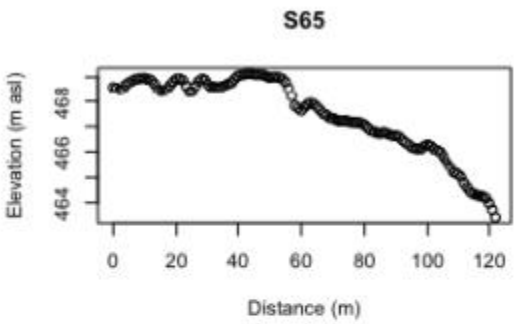

S63_2
Elevation (m asl)
466
470
474
0
20
40
60
80
100
120
140
Distance (m)

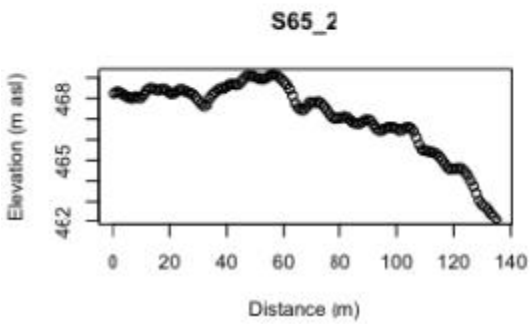

S63_3
Elevation (m asl)
466
470
474
0
50
100
150
Distance (m)

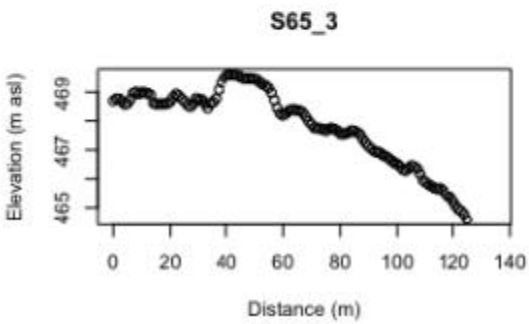

S64
Elevation (m asl)
454
460
466
0
50
100
150
Distance (m)

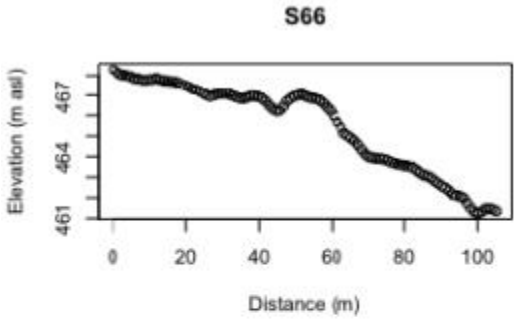

S64_2
Elevation (m asl)
458
462
466
0
20
40
60
80
100
120
140
Distance (m)

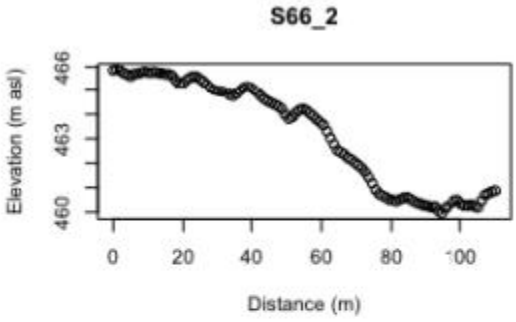

S64_3
Elevation (m asl)
456
460
464
0
20
40
60
80
100
120
140
Distance (m)

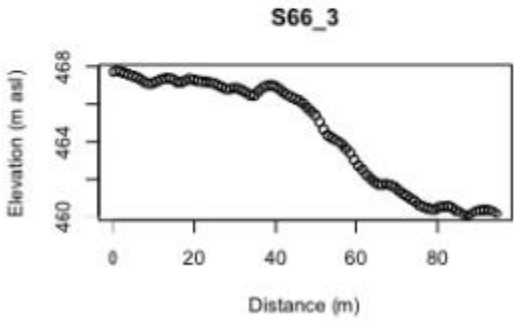

S65
Elevation (m asl)
464
466
468
0
20
40
60
80
100
120
Distance (m)

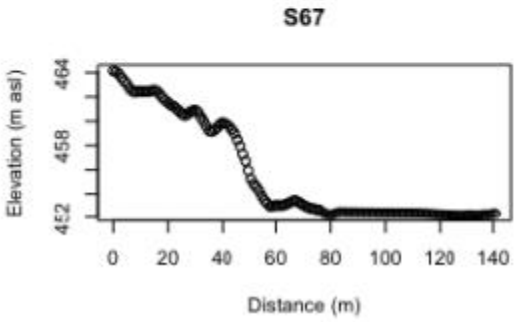

S65_2
Elevation (m asl)
462
465
468
0
20
40
60
80
100
120
140
Distance (m)

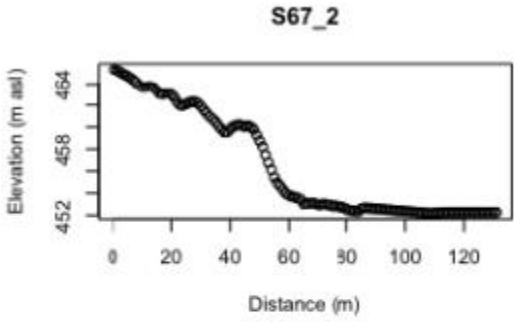

S65_3
Elevation (m asl)
465
467
469
0
20
40
60
80
100
120
140
Distance (m)

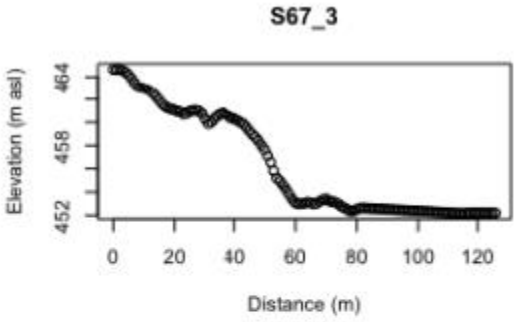

S66
Elevation (m asl)
461
464
467
0
20
40
60
80
100
Distance (m)

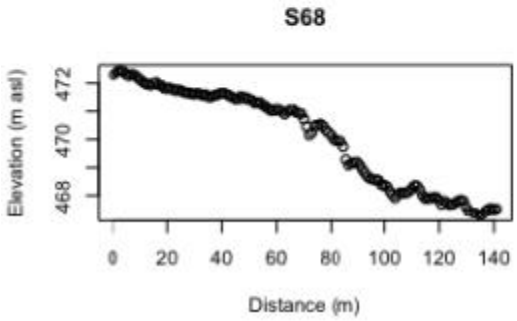

S66_2
Elevation (m asl)
460
463
466
0
20
40
60
80
100
Distance (m)

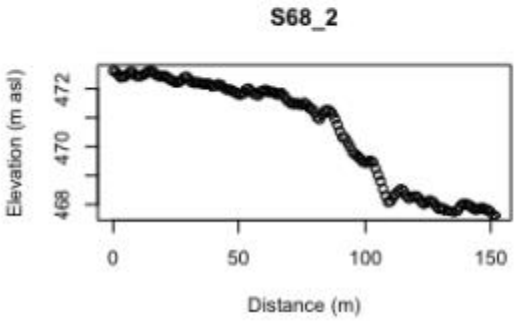

S66_3
Elevation (m asl)
460
464
468
0
20
40
60
80
Distance (m)

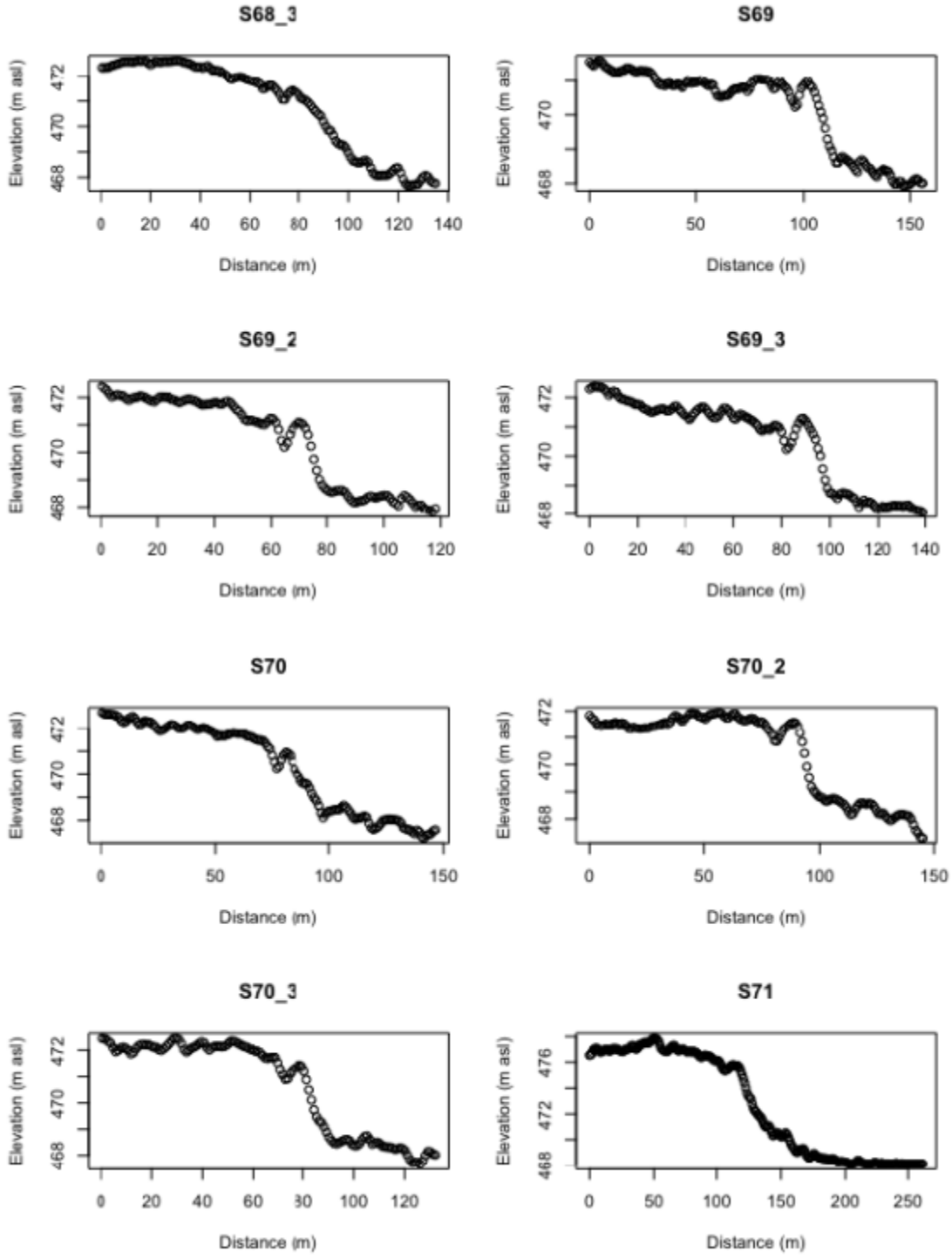

S67
Elevation (m asl)
452
458
464
0
20
40
60
80
100
120
140
Distance (m)

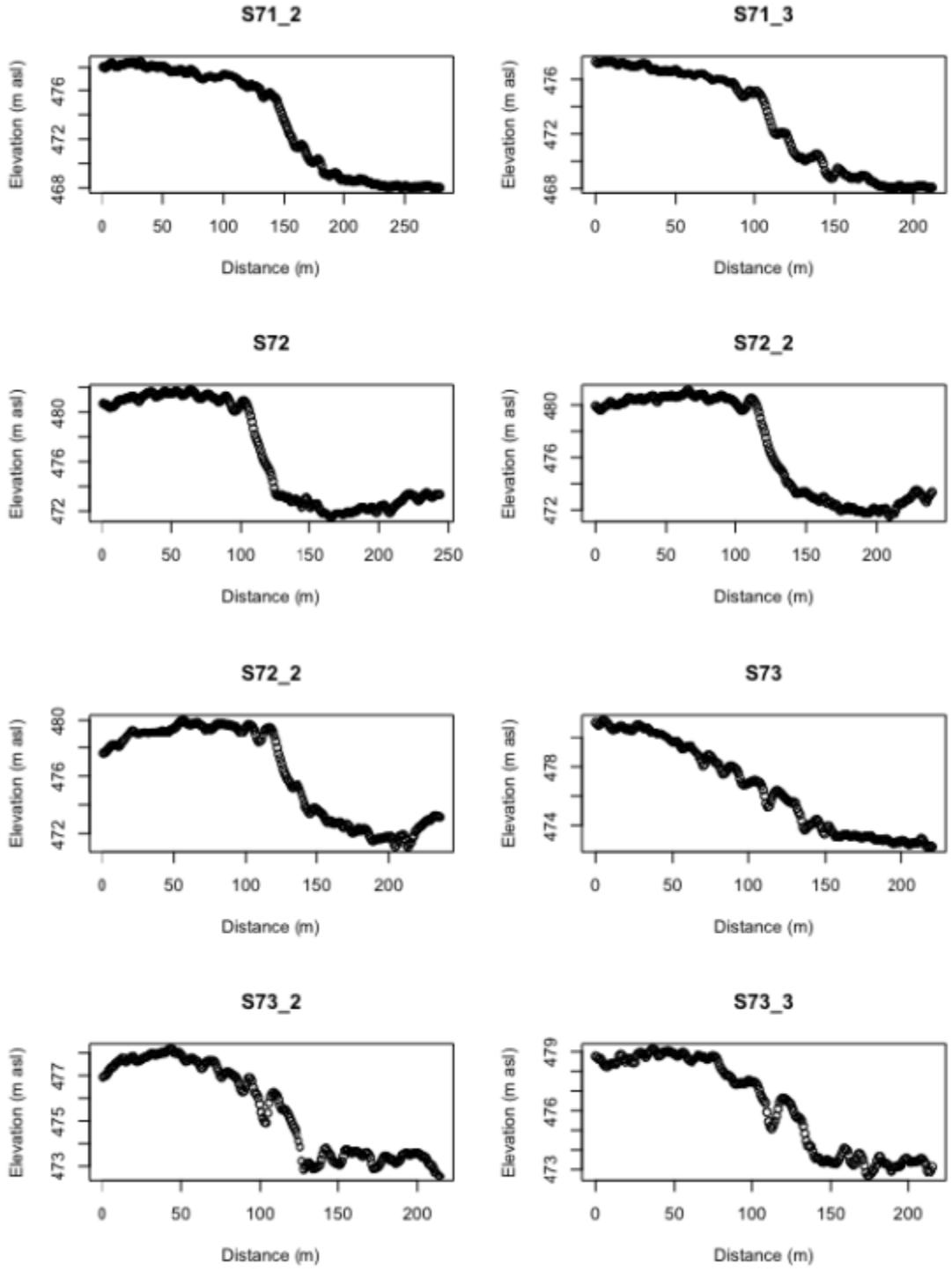

S67_2
Elevation (m asl)
452
458
464
0
20
40
60
80
100
120
Distance (m)

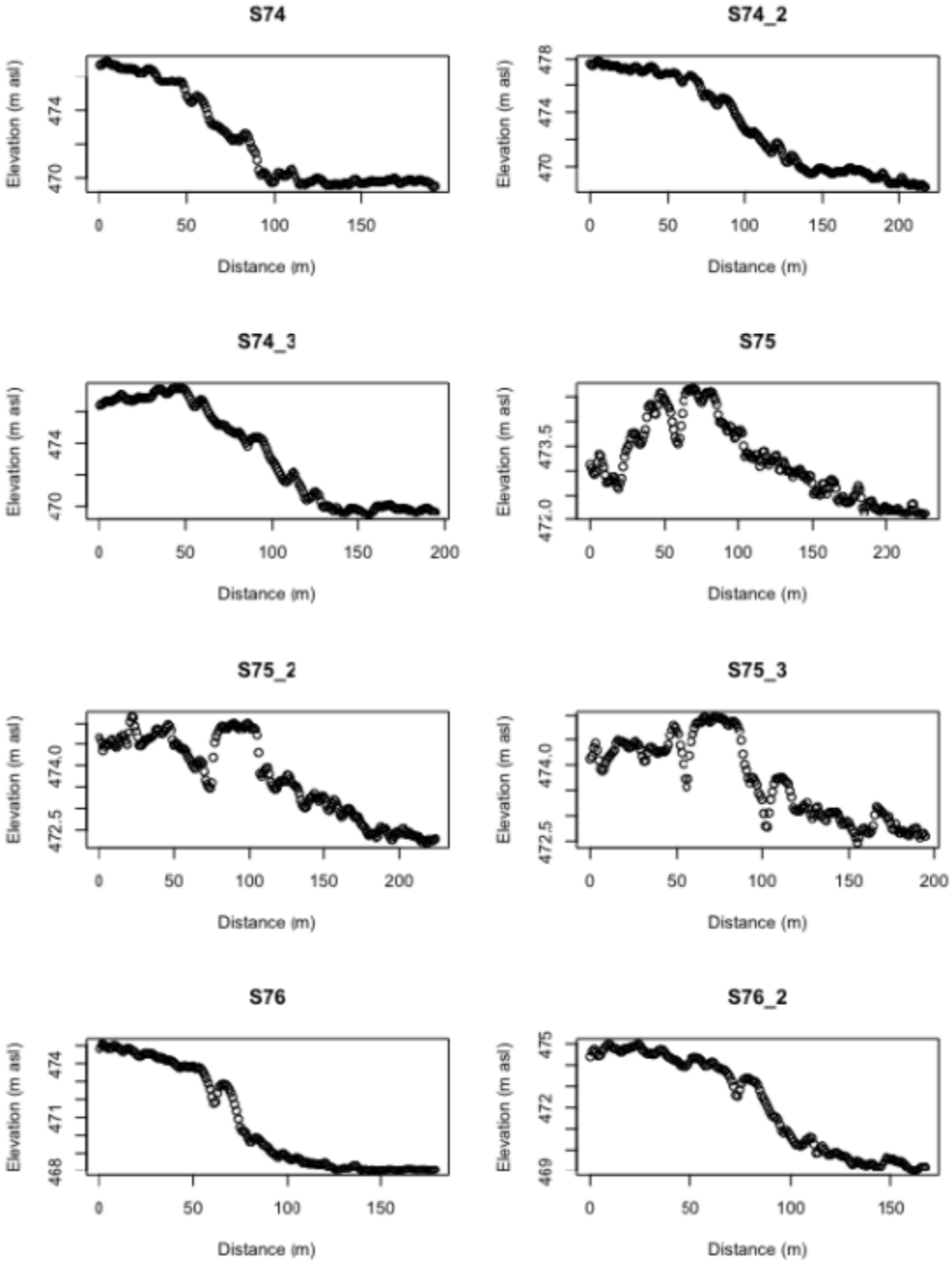

S67_3
Elevation (m asl)
452
458
464
0
20
40
60
80
100
120
Distance (m)

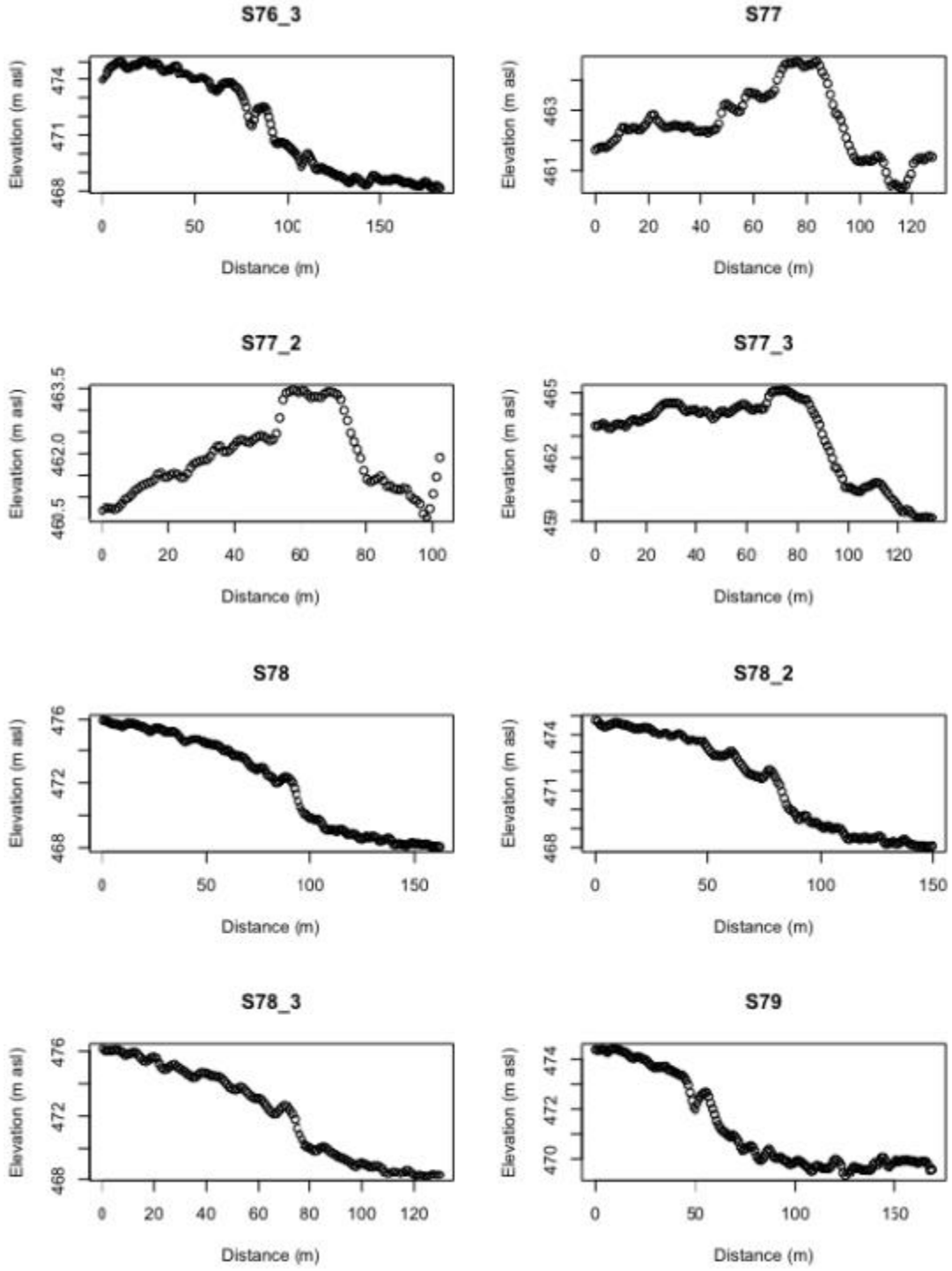

S68
Elevation (m asl)
468
470
472
0
20
40
60
80
100
120
140
Distance (m)

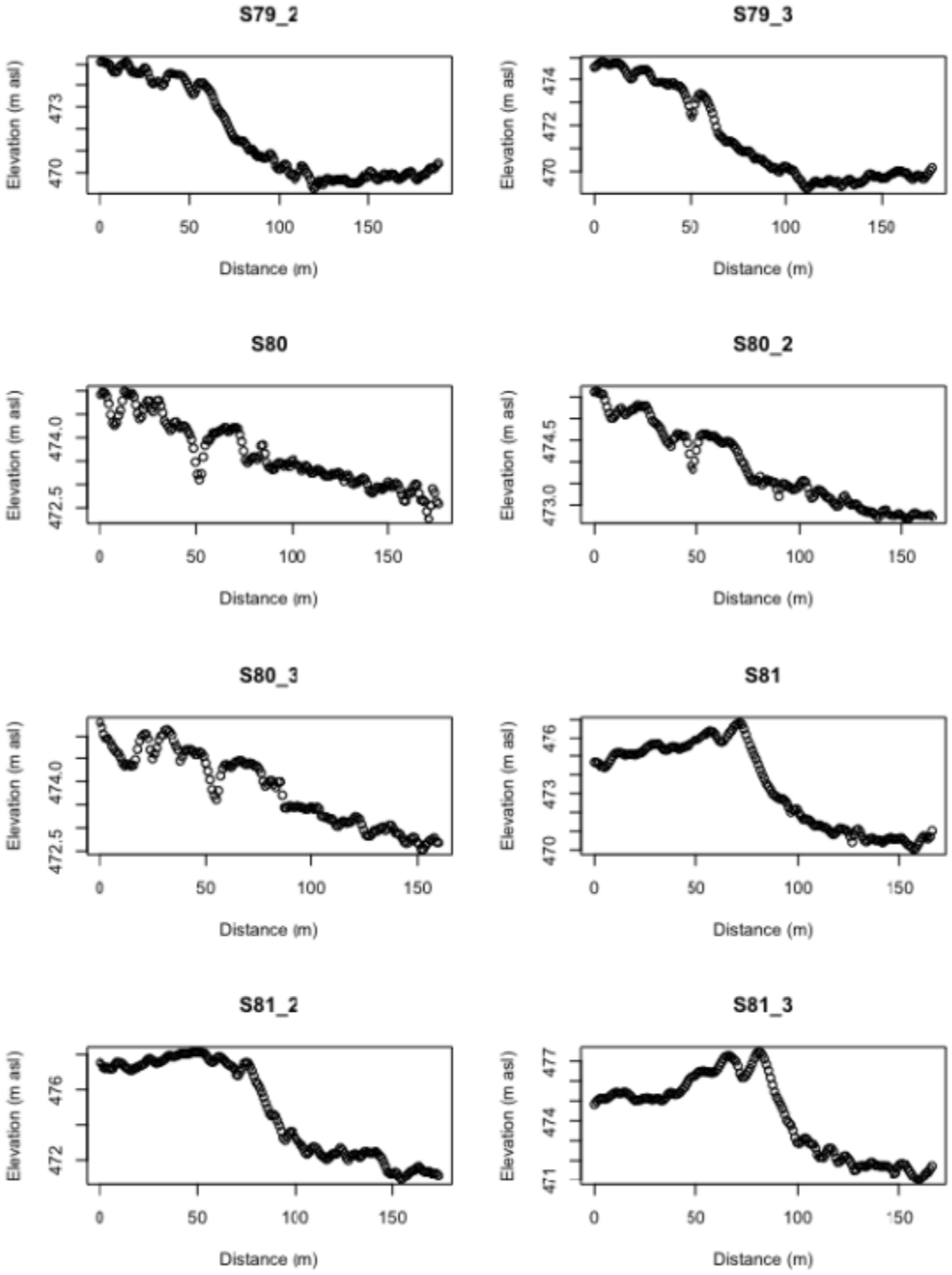

S68_2
Elevation (m asl)
468
470
472
0
50
100
150
Distance (m)

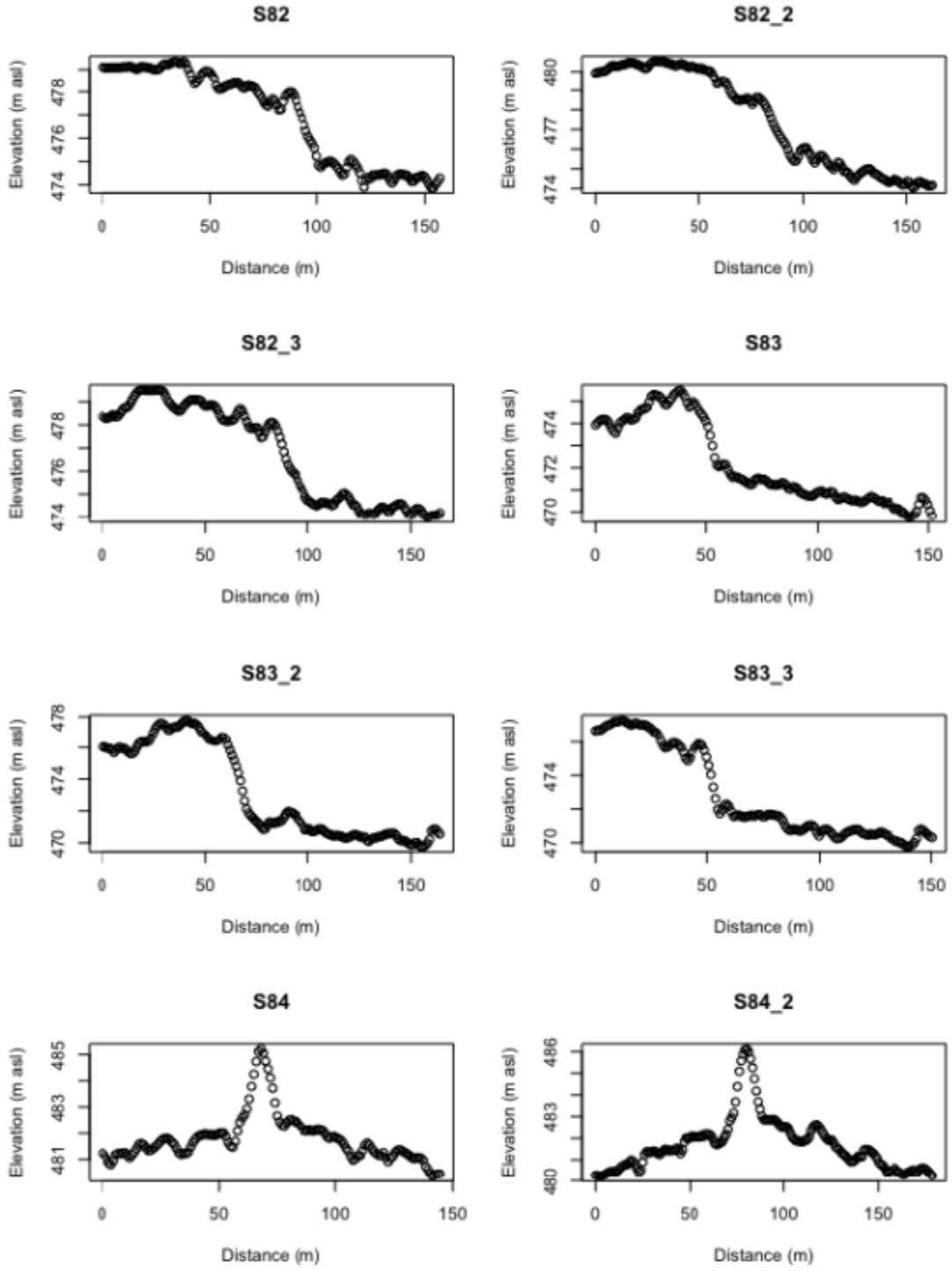

S68_3
Elevation (m asl)
468
470
472
0
20
40
60
80
100
120
140
Distance (m)
S69
Elevation (m asl)
468
470
0
50
100
150
Distance (m)
S69_2
Elevation (m asl)
468
470
472
0
20
40
60
80
100
120
Distance (m)
S69_3
Elevation (m asl)
468
470
472
0
20
40
60
80
100
120
140
Distance (m)
S70
Elevation (m asl)
468
470
472
0
50
100
150
Distance (m)
S70_2
Elevation (m asl)
468
470
472
0
50
100
150
Distance (m)
S70_3
Elevation (m asl)
468
470
472
0
20
40
60
80
100
120
Distance (m)
S71
Elevation (m asl)
468
472
476
0
50
100
150
200
250
Distance (m)

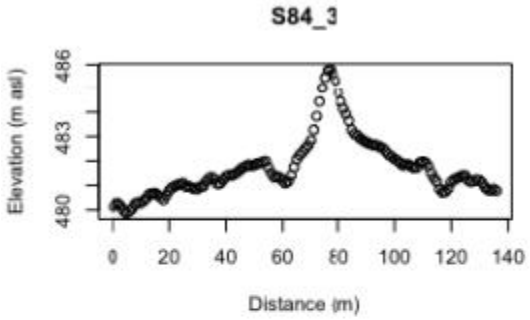

S71_2
Elevation (m asl)
468
472
476
0
50
100
150
200
250
Distance (m)
S71_3
Elevation (m asl)
468
472
476
0
50
100
150
200
Distance (m)
S72
Elevation (m asl)
472
476
480
0
50
100
150
200
250
Distance (m)
S72_2
Elevation (m asl)
472
476
480
0
50
100
150
200
Distance (m)
S72_2
Elevation (m asl)
472
476
480
0
50
100
150
200
Distance (m)
S73
Elevation (m asl)
474
478
0
50
100
150
200
Distance (m)
S73_2
Elevation (m asl)
473
475
477
0
50
100
150
200
Distance (m)
S73_3
Elevation (m asl)
473
476
479
0
50
100
150
200
Distance (m)

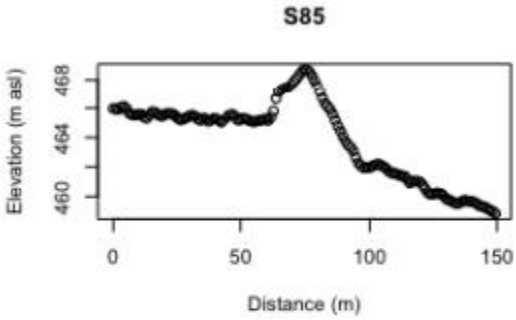

S74
Elevation (m asl)
470
474
0
50
100
150
Distance (m)
S74_2
Elevation (m asl)
470
474
478
0
50
100
150
200
Distance (m)
S74_3
Elevation (m asl)
470
474
0
50
100
150
200
Distance (m)
S75
Elevation (m asl)
472.0
473.5
0
50
100
150
200
Distance (m)
S75_2
Elevation (m asl)
472.5
474.0
0
50
100
150
200
Distance (m)
S75_3
Elevation (m asl)
472.5
474.0
0
50
100
150
200
Distance (m)
S76
Elevation (m asl)
468
471
474
0
50
100
150
Distance (m)
S76_2
Elevation (m asl)
469
472
475
0
50
100
150
Distance (m)

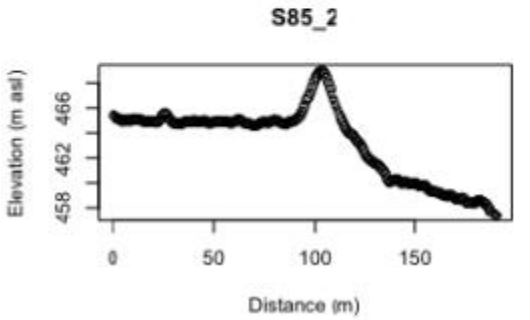

S76_3
Elevation (m asl)
468
471
474
0
50
100
150
Distance (m)
S77
Elevation (m asl)
461
463
0
20
40
60
80
100
120
Distance (m)
S77_2
Elevation (m asl)
460.5
462.0
463.5
0
20
40
60
80
100
Distance (m)
S77_3
Elevation (m asl)
459
462
465
0
20
40
60
80
100
120
Distance (m)
S78
Elevation (m asl)
468
472
476
0
50
100
150
Distance (m)
S78_2
Elevation (m asl)
468
471
474
0
50
100
150
Distance (m)
S78_3
Elevation (m asl)
468
472
476
0
20
40
60
80
100
120
Distance (m)
S79
Elevation (m asl)
470
472
474
0
50
100
150
Distance (m)

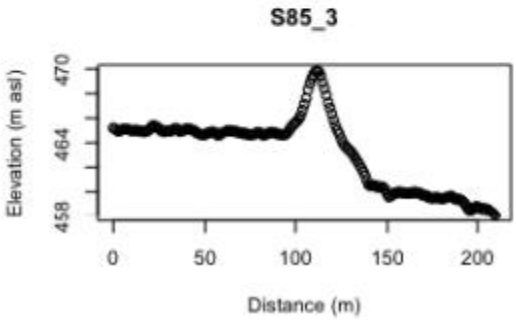

S79_2
Elevation (m asl)
470
473
0
50
100
150
Distance (m)
S79_3
Elevation (m asl)
470
472
474
0
50
100
150
Distance (m)
S80
Elevation (m asl)
472.5
474.0
0
50
100
150
Distance (m)
S80_2
Elevation (m asl)
473.0
474.5
0
50
100
150
Distance (m)
S80_3
Elevation (m asl)
472.5
474.0
0
50
100
150
Distance (m)
S81
Elevation (m asl)
470
473
476
0
50
100
150
Distance (m)
S81_2
Elevation (m asl)
472
476
0
50
100
150
Distance (m)
S81_3
Elevation (m asl)
471
474
477
0
50
100
150
Distance (m)

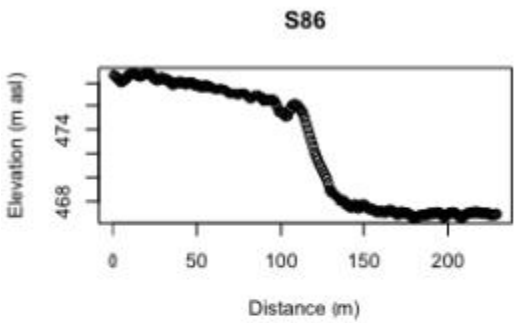

S82
Elevation (m asl)
474
476
478
0
50
100
150
Distance (m)
S82_2
Elevation (m asl)
474
477
480
0
50
100
150
Distance (m)
S82_3
Elevation (m asl)
474
476
478
0
50
100
150
Distance (m)
S83
Elevation (m asl)
470
472
474
0
50
100
150
Distance (m)
S83_2
Elevation (m asl)
470
474
478
0
50
100
150
Distance (m)
S83_3
Elevation (m asl)
470
474
0
50
100
150
Distance (m)
S84
Elevation (m asl)
481
483
485
0
50
100
150
Distance (m)
S84_2
Elevation (m asl)
480
483
486
0
50
100
150
Distance (m)

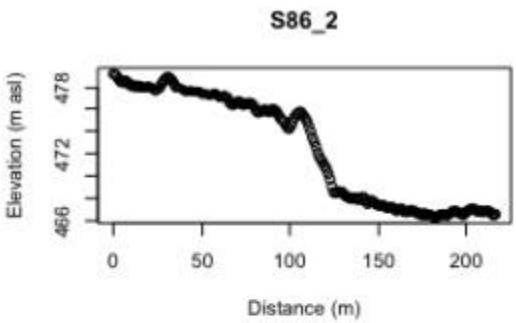

S84_3
Elevation (m asl)
480
483
486
0
20
40
60
80
100
120
140
Distance (m)

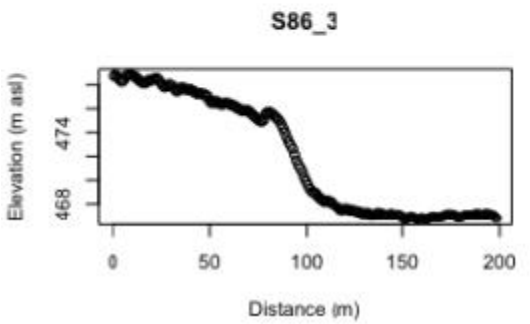

S85
Elevation (m asl)
460
464
468
0
50
100
150
Distance (m)

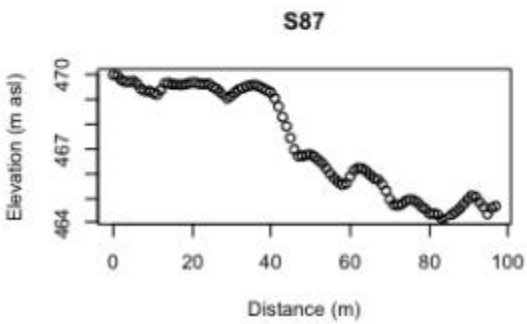

S85_2
Elevation (m asl)
458
462
466
0
50
100
150
Distance (m)

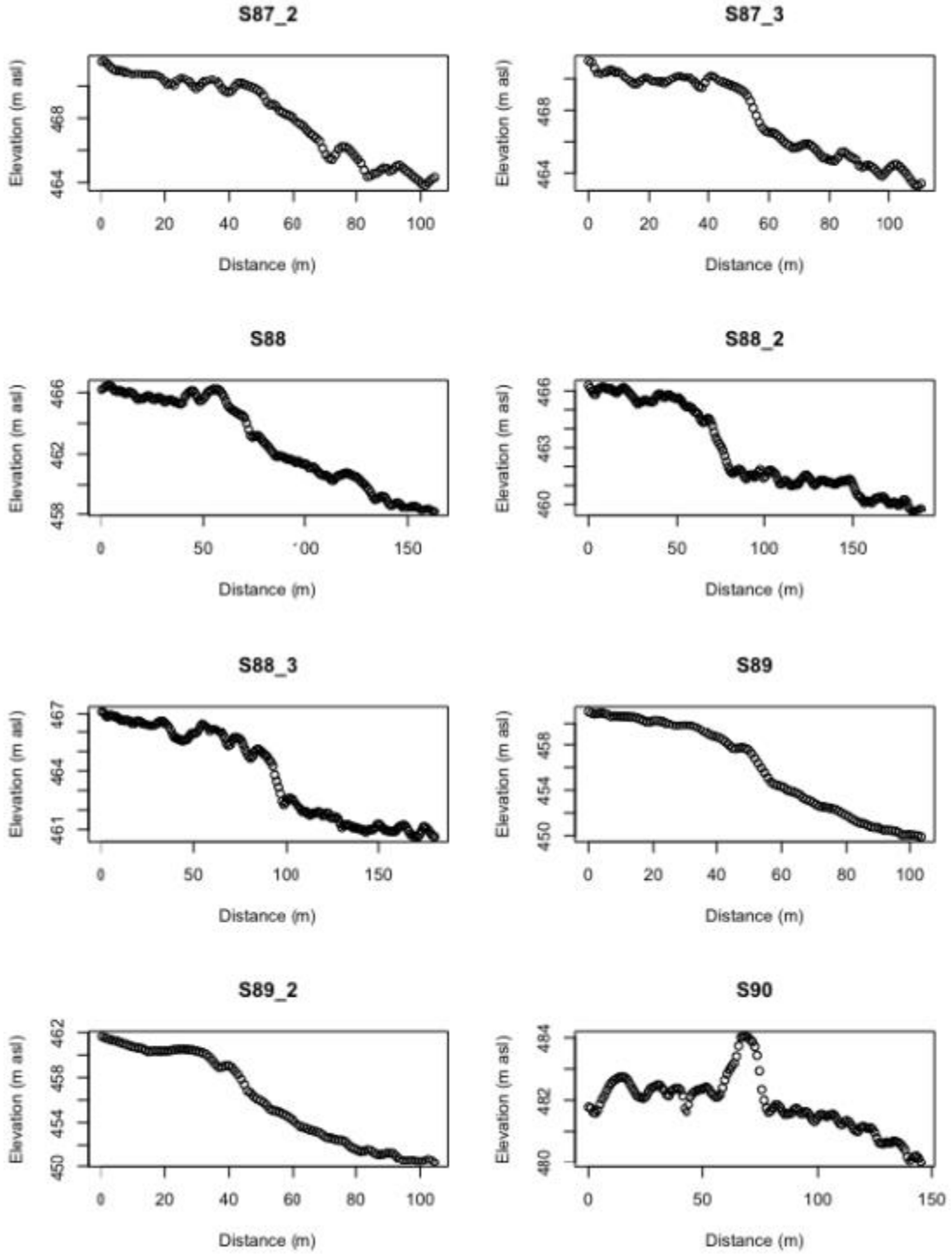

S85_3
Elevation (m asl)
458
464
470
0
50
100
150
200
Distance (m)

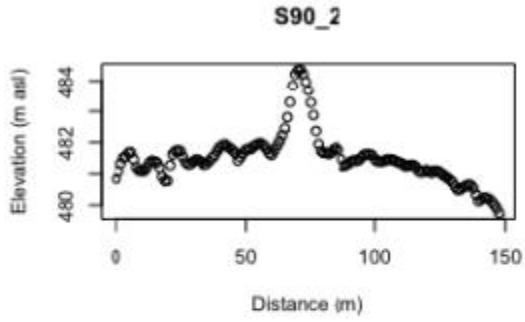

S86
Elevation (m asl)
468
474
0
50
100
150
200
Distance (m)

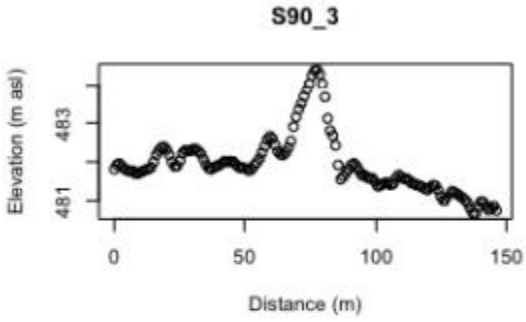

S86_2
Elevation (m asl)
466
472
478
0
50
100
150
200
Distance (m)

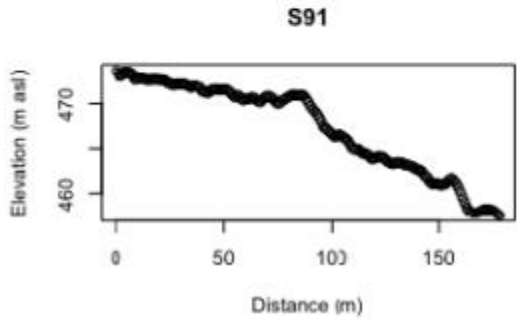

S86_3
Elevation (m asl)
468
474
0
50
100
150
200
Distance (m)

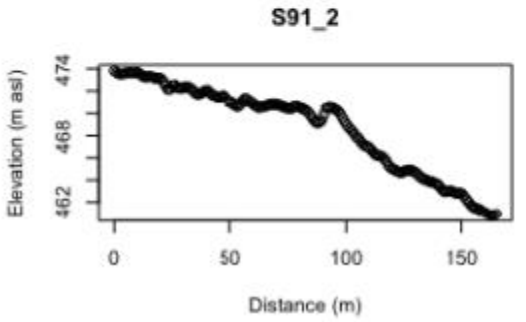

S87
Elevation (m asl)
464
467
470
0
20
40
60
80
100
Distance (m)

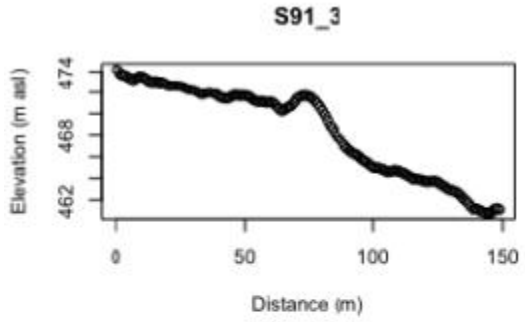

S87_2
Elevation (m asl)
464
468
0
20
40
60
80
100
Distance (m)
S87_3
Elevation (m asl)
464
468
0
20
40
60
80
100
Distance (m)
S88
Elevation (m asl)
458
462
466
0
50
100
150
Distance (m)
S88_2
Elevation (m asl)
460
463
466
0
50
100
150
Distance (m)
S88_3
Elevation (m asl)
461
464
467
0
50
100
150
Distance (m)
S89
Elevation (m asl)
450
454
458
0
20
40
60
80
100
Distance (m)
S89_2
Elevation (m asl)
450
454
458
462
0
20
40
60
80
100
Distance (m)
S90
Elevation (m asl)
480
482
484
0
50
100
150
Distance (m)

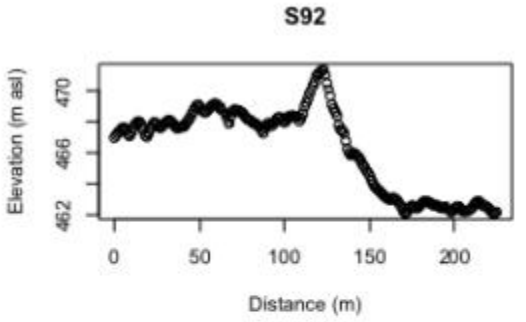

S90_2
Elevation (m asl)
480
482
484
0
50
100
150
Distance (m)

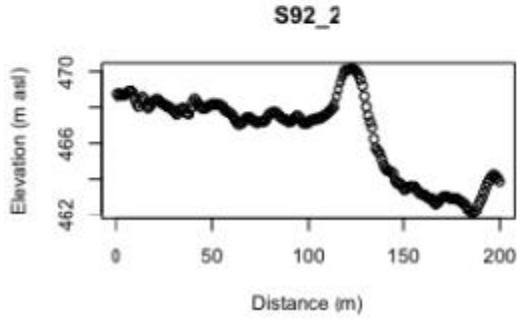

S90_3
Elevation (m asl)
481
483
0
50
100
150
Distance (m)

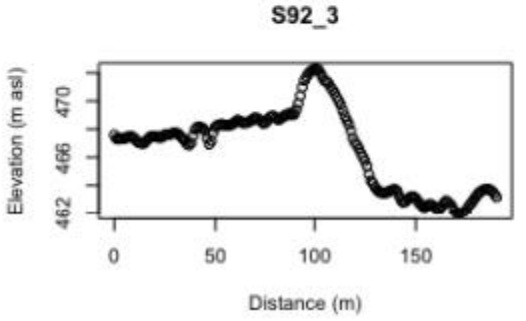

S91
Elevation (m asl)
460
470
0
50
100
150
Distance (m)

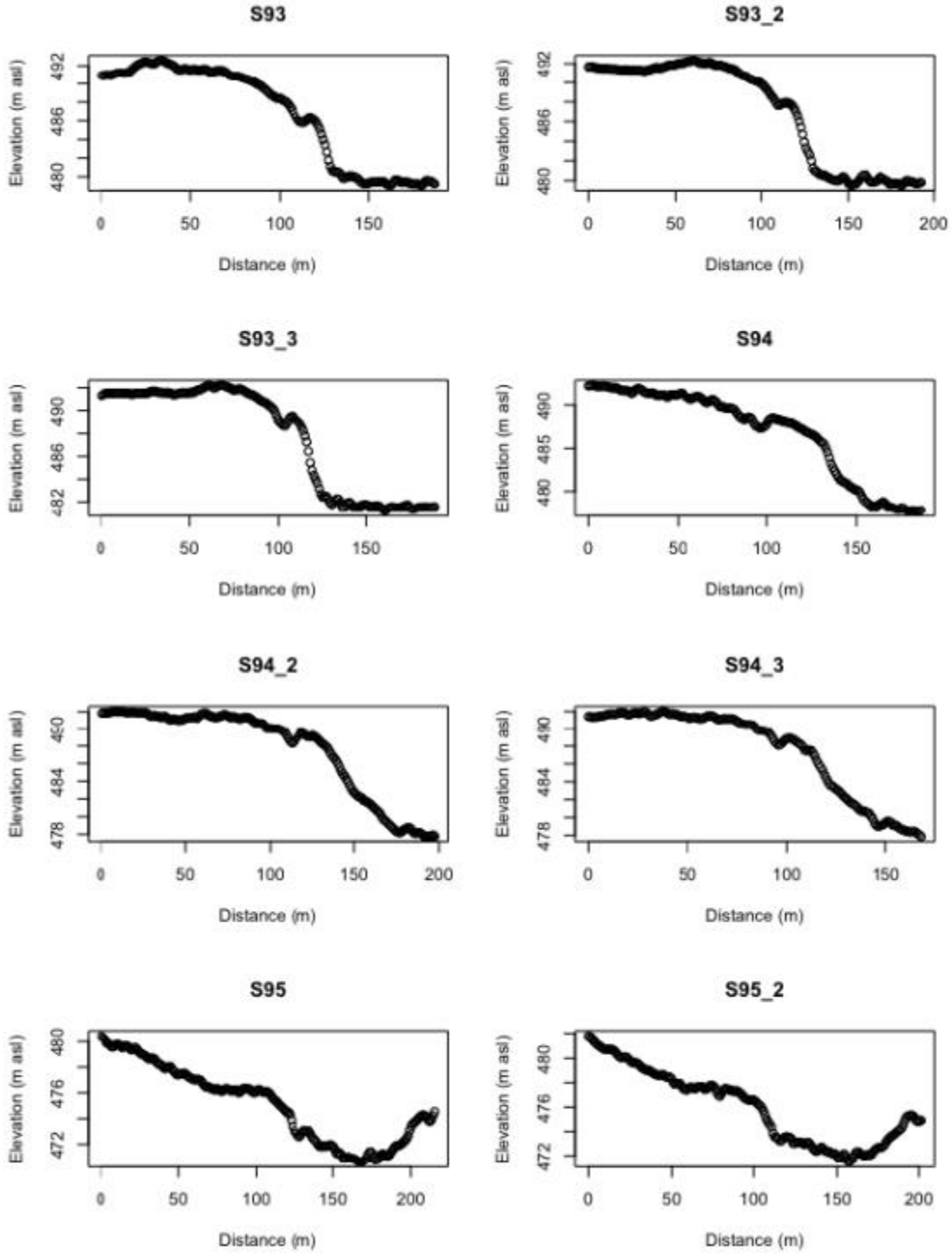

S91_2
Elevation (m asl)
462
468
474
0
50
100
150
Distance (m)

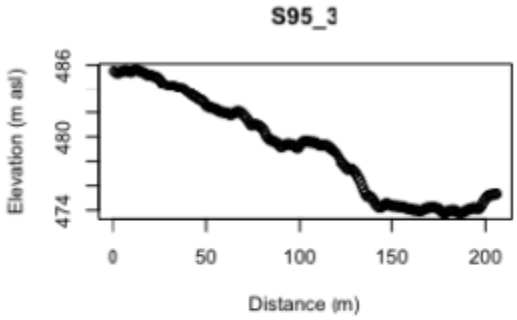

S91_3
Elevation (m asl)
462
468
474
0
50
100
150
Distance (m)

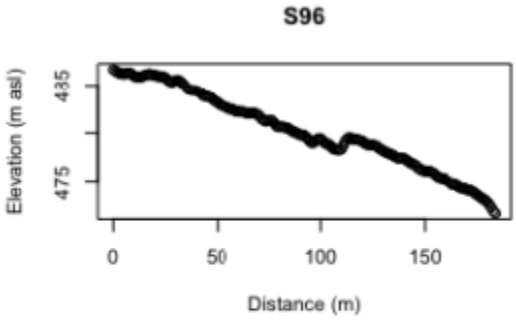

S92
Elevation (m asl)
462
466
470
0
50
100
150
200
Distance (m)

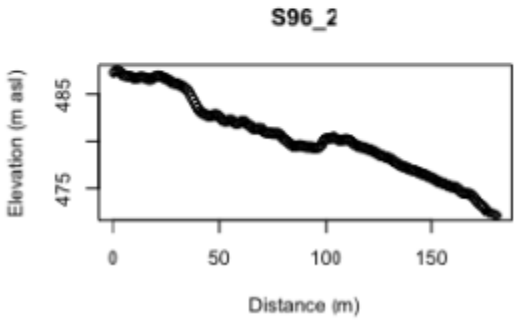

S92_2
Elevation (m asl)
462
466
470
0
50
100
150
200
Distance (m)

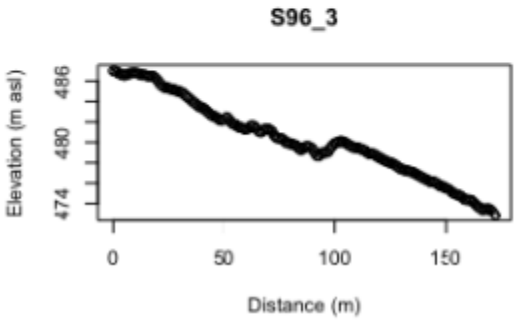

S92_3
Elevation (m asl)
462
466
470
0
50
100
150
Distance (m)

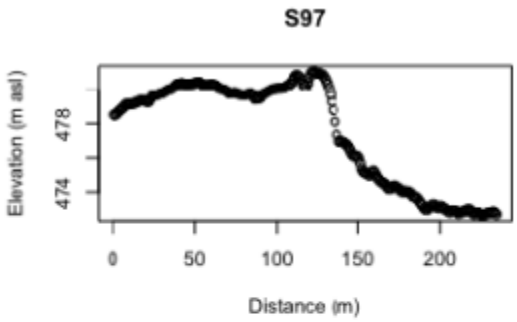

S93
Elevation (m asl)
480
486
492
0
50
100
150
Distance (m)
S93_2
Elevation (m asl)
480
486
492
0
50
100
150
200
Distance (m)
S93_3
Elevation (m asl)
482
486
490
0
50
100
150
Distance (m)
S94
Elevation (m asl)
480
485
490
0
50
100
150
Distance (m)
S94_2
Elevation (m asl)
478
484
490
0
50
100
150
200
Distance (m)
S94_3
Elevation (m asl)
478
484
490
0
50
100
150
Distance (m)
S95
Elevation (m asl)
472
476
480
0
50
100
150
200
Distance (m)
S95_2
Elevation (m asl)
472
476
480
0
50
100
150
200
Distance (m)

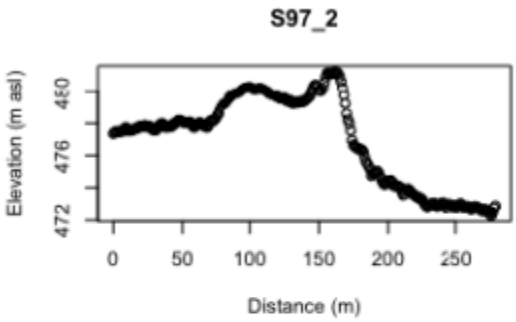

S95_3
Elevation (m asl)
474
480
486
0
50
100
150
200
Distance (m)

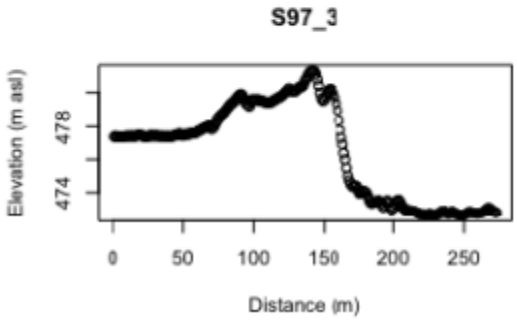

S96
Elevation (m asl)
475
435
0
50
100
150
Distance (m)

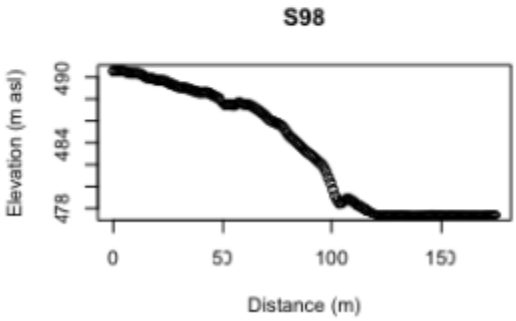

S96_2
Elevation (m asl)
475
485
0
50
100
150
Distance (m)

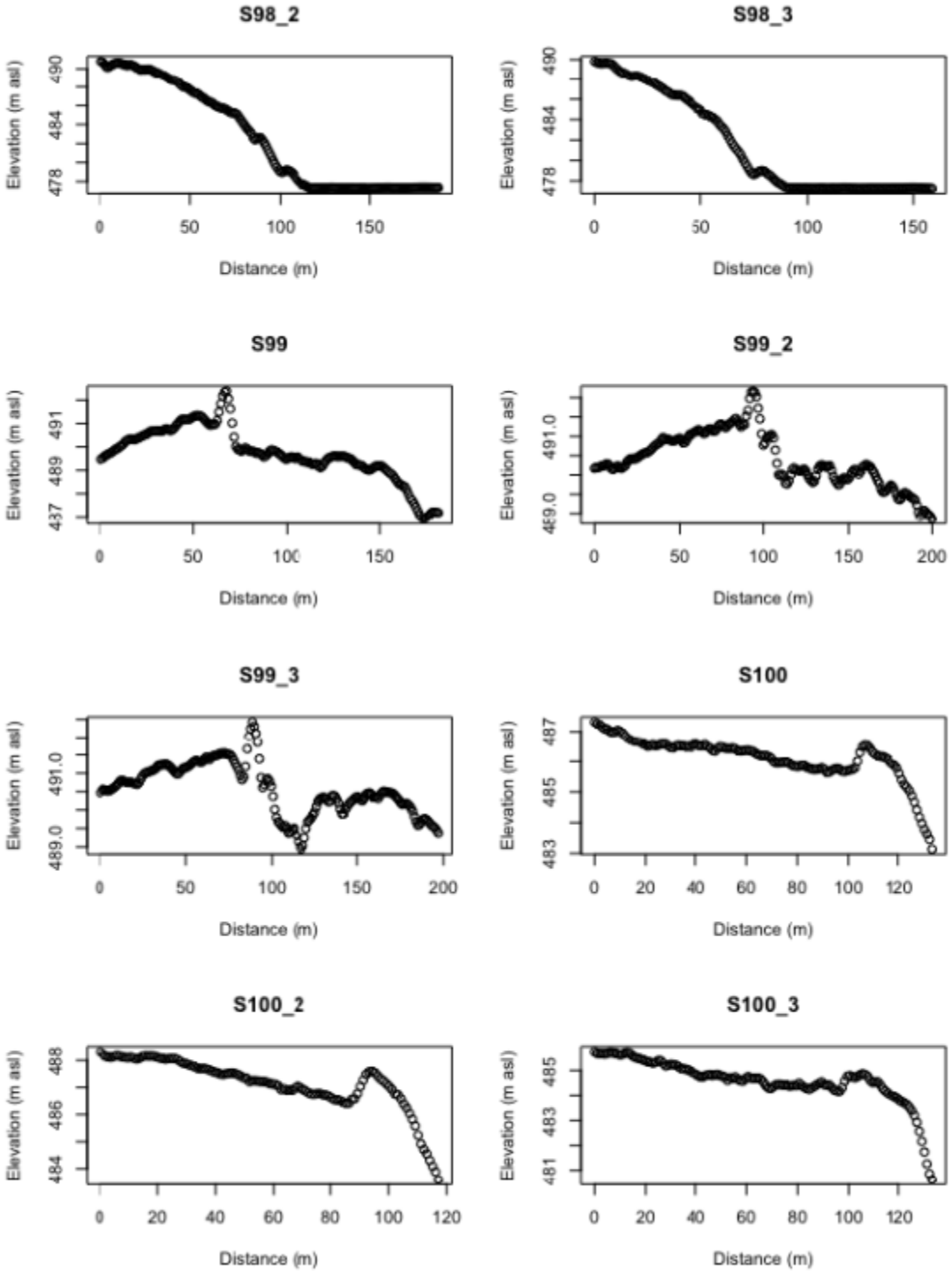

S96_3
Elevation (m asl)
474
480
486
0
50
100
150
Distance (m)

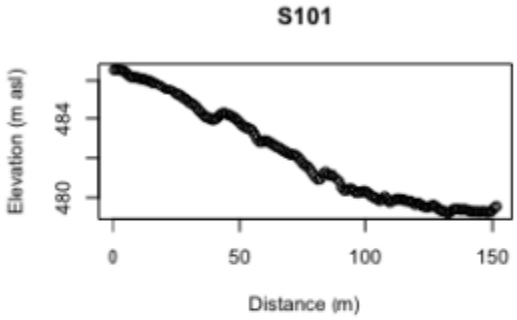

S97
Elevation (m asl)
474
478
0
50
100
150
200
Distance (m)

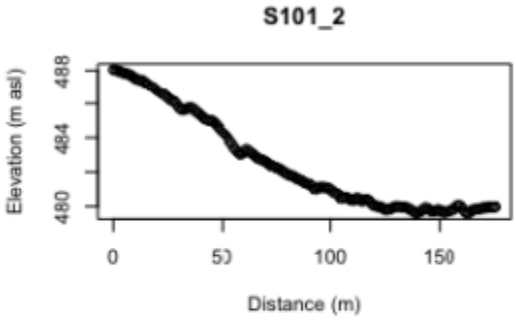

S97_2
Elevation (m asl)
472
476
0
50
100
150
200
250
Distance (m)

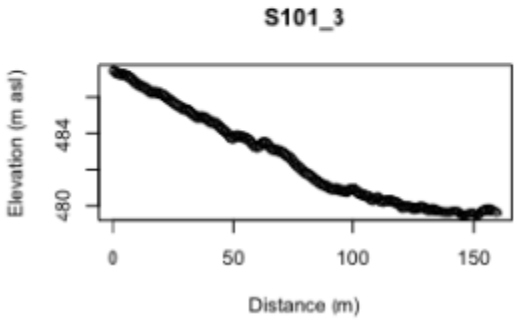

S97_3
Elevation (m asl)
474
478
0
50
100
150
200
250
Distance (m)

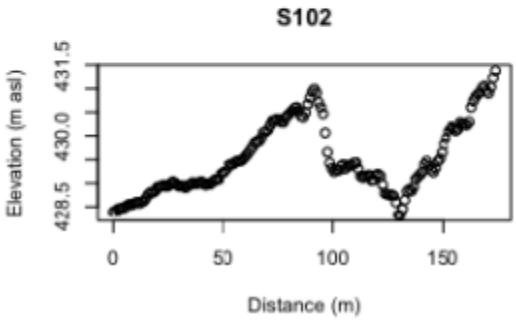

S98
Elevation (m asl)
478
484
490
0
50
100
150
Distance (m)

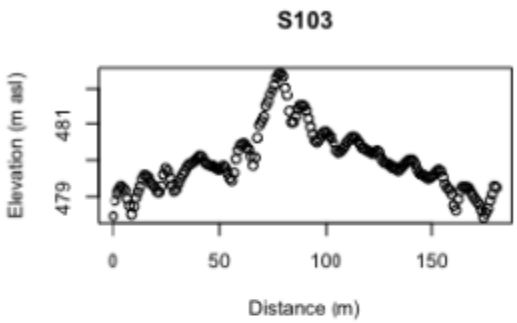

S98_2
Elevation (m asl)
478
484
490
0
50
100
150
Distance (m)
S98_3
Elevation (m asl)
478
484
490
0
50
100
150
Distance (m)
S99
Elevation (m asl)
437
489
491
0
50
100
150
Distance (m)
S99_2
Elevation (m asl)
489.0
491.0
0
50
100
150
200
Distance (m)
S99_3
Elevation (m asl)
489.0
491.0
0
50
100
150
200
Distance (m)
S100
Elevation (m asl)
483
485
487
0
20
40
60
80
100
120
Distance (m)
S100_2
Elevation (m asl)
484
486
488
0
20
40
60
80
100
120
Distance (m)
S100_3
Elevation (m asl)
481
483
485
0
20
40
60
80
100
120
Distance (m)

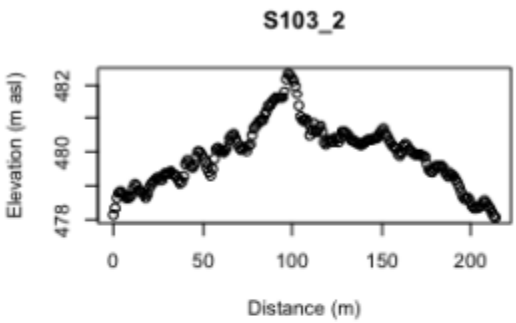

S101
Elevation (m asl)
480
484
0
50
100
150
Distance (m)

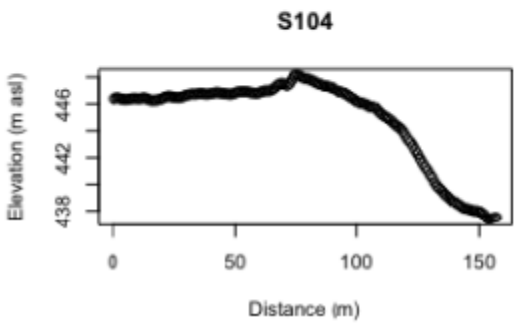

S101_2
Elevation (m asl)
480
484
488
0
50
100
150
Distance (m)

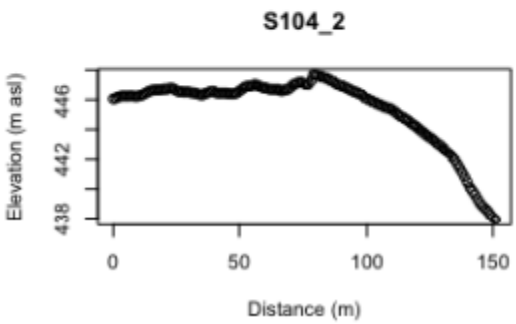

S101_3
Elevation (m asl)
480
484
0
50
100
150
Distance (m)

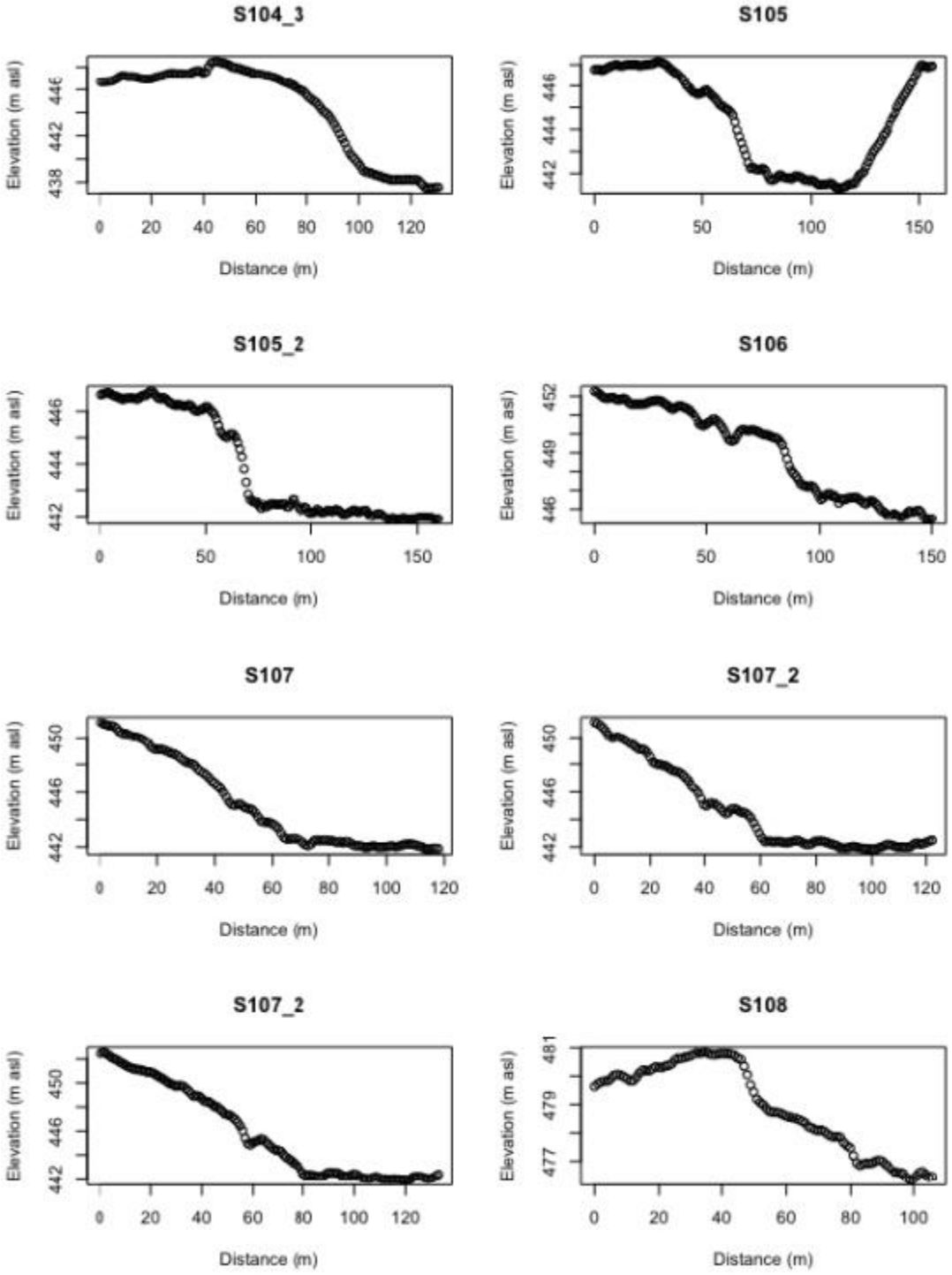

S102
Elevation (m asl)
428.5
430.0
431.5
0
50
100
150
Distance (m)

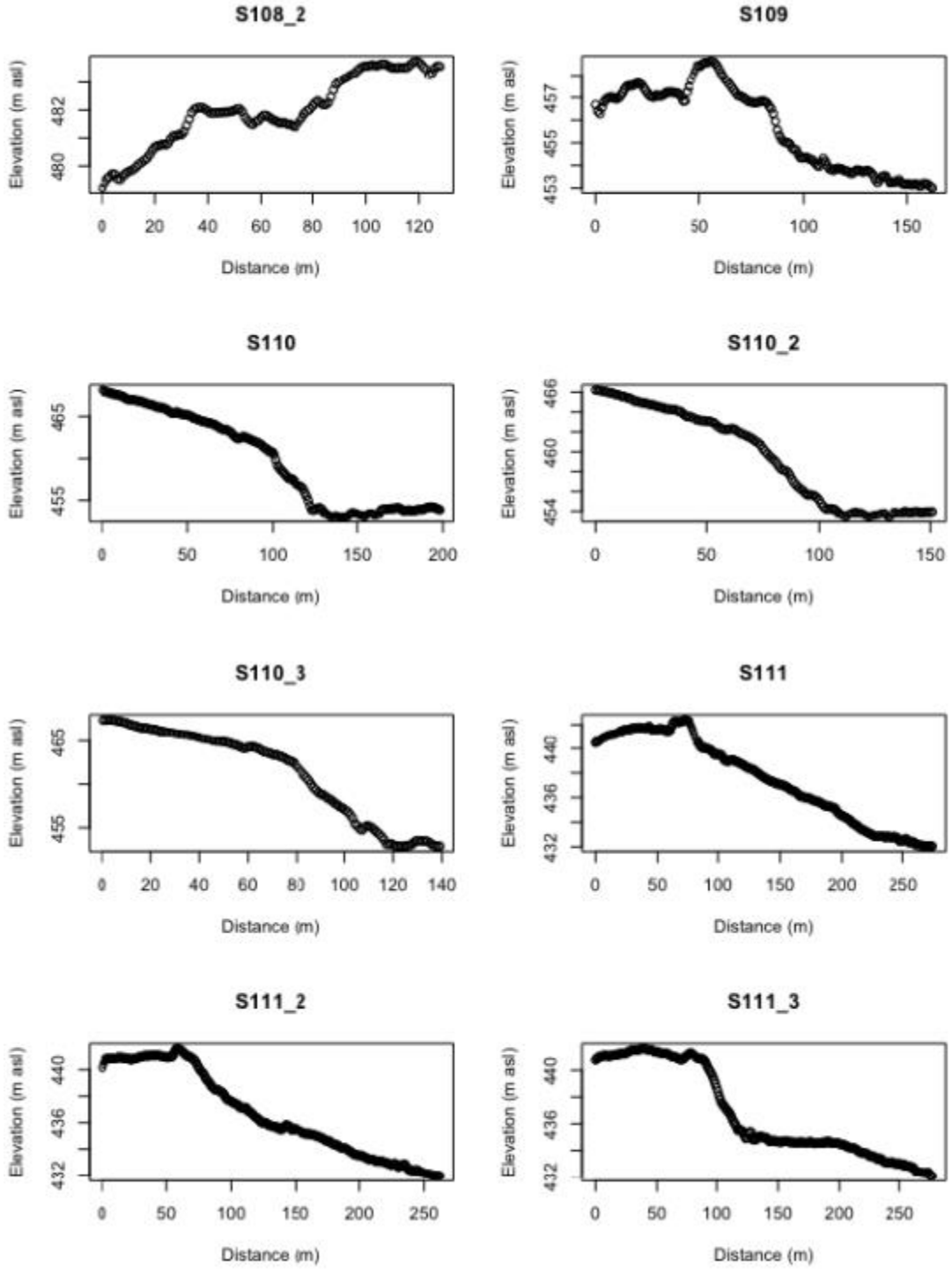

S103
Elevation (m asl)
479
481
0
50
100
150
Distance (m)

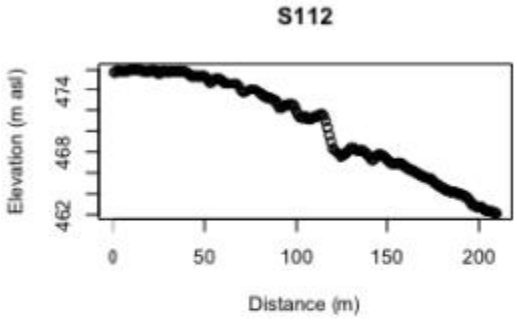

S103_2
Elevation (m asl)
478
480
482
0
50
100
150
200
Distance (m)

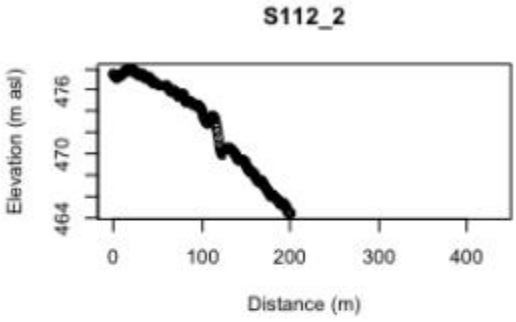

S104
Elevation (m asl)
438
442
446
0
50
100
150
Distance (m)

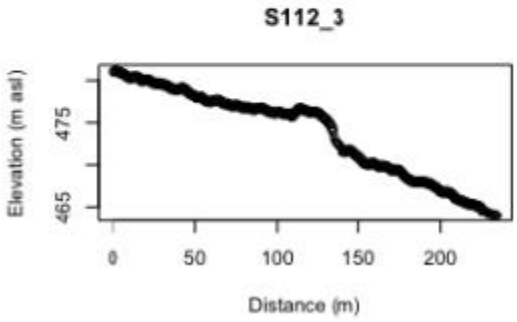

S104_2
Elevation (m asl)
438
442
446
0
50
100
150
Distance (m)

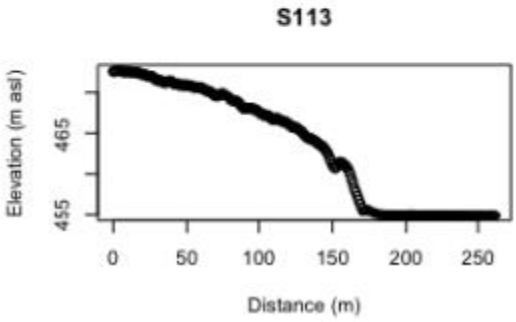

S104_3
Elevation (m asl)
438 442 446
0 20 40 60 80 100 120
Distance (m)
S105
Elevation (m asl)
442 444 446
0 50 100 150
Distance (m)
S105_2
Elevation (m asl)
442 444 446
0 50 100 150
Distance (m)
S106
Elevation (m asl)
446 449 452
0 50 100 150
Distance (m)
S107
Elevation (m asl)
442 446 450
0 20 40 60 80 100 120
Distance (m)
S107_2
Elevation (m asl)
442 446 450
0 20 40 60 80 100 120
Distance (m)
S107_2
Elevation (m asl)
442 446 450
0 20 40 60 80 100 120
Distance (m)
S108
Elevation (m asl)
477 479 481
0 20 40 60 80 100
Distance (m)

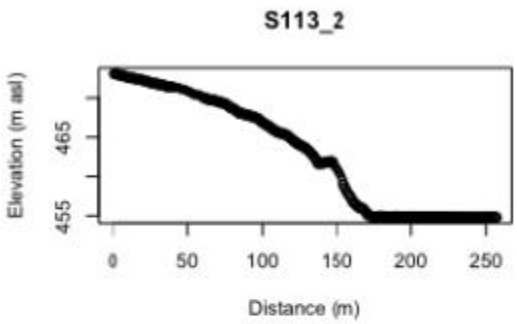

S108_2
Elevation (m asl)
480
482
0
20
40
60
80
100
120
Distance (m)
S109
Elevation (m asl)
453
455
457
0
50
100
150
Distance (m)
S110
Elevation (m asl)
455
465
0
50
100
150
200
Distance (m)
S110_2
Elevation (m asl)
454
460
466
0
50
100
150
Distance (m)
S110_3
Elevation (m asl)
455
465
0
20
40
60
80
100
120
140
Distance (m)
S111
Elevation (m asl)
432
436
440
0
50
100
150
200
250
Distance (m)
S111_2
Elevation (m asl)
432
436
440
0
50
100
150
200
250
Distance (m)
S111_3
Elevation (m asl)
432
436
440
0
50
100
150
200
250
Distance (m)

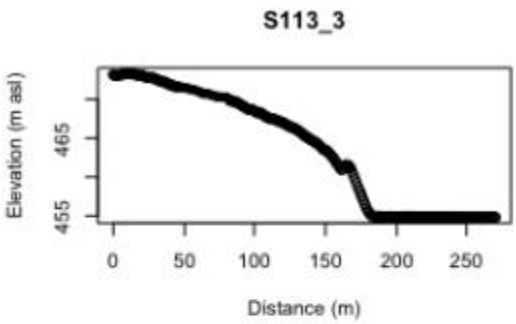

S112
Elevation (m asl)
462
468
474
0
50
100
150
200
Distance (m)

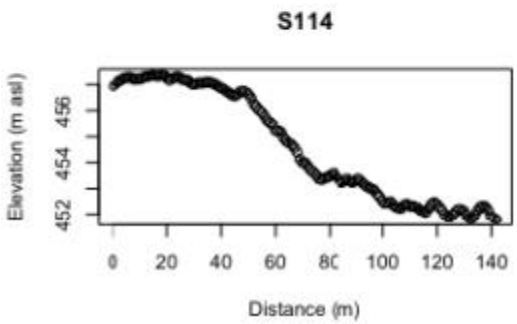

S112_2
Elevation (m asl)
464
470
476
0
100
200
300
400
Distance (m)

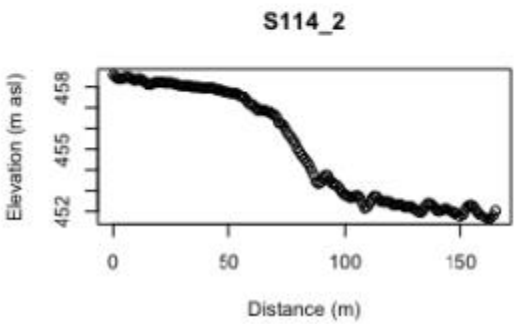

S112_3
Elevation (m asl)
465
475
0
50
100
150
200
Distance (m)

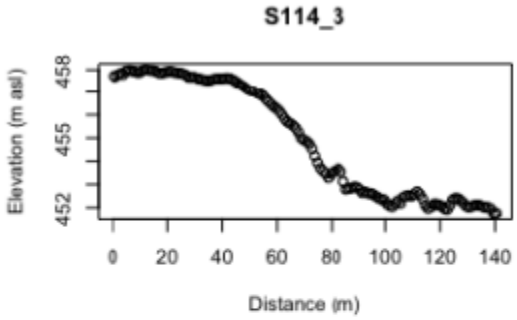

S113
Elevation (m asl)
455
465
0
50
100
150
200
250
Distance (m)

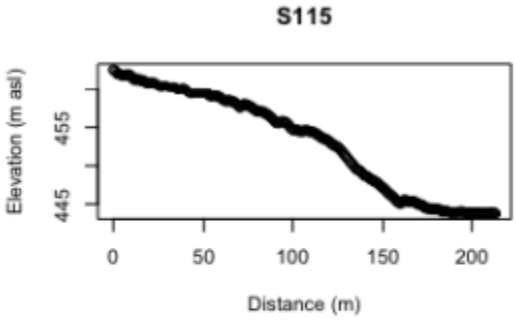

S113_2
Elevation (m asl)
455
465
0
50
100
150
200
250
Distance (m)

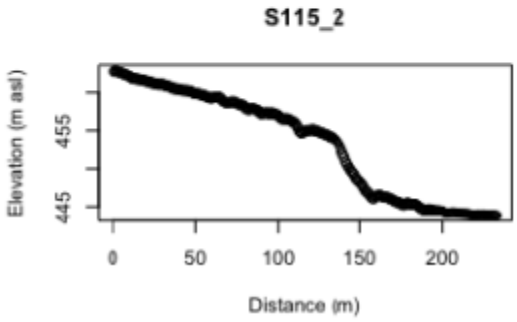

S113_3
Elevation (m asl)
455
465
0
50
100
150
200
250
Distance (m)

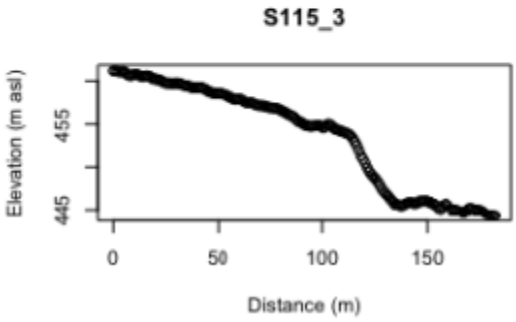

S114
Elevation (m asl)
452
454
456
0
20
40
60
80
100
120
140
Distance (m)

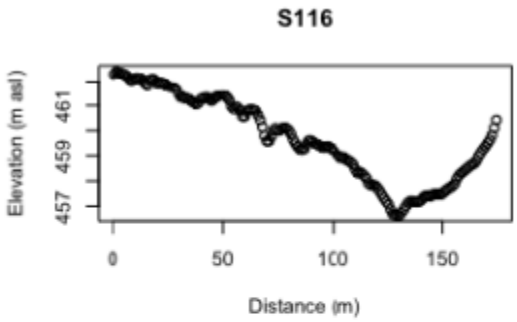

S114_2
Elevation (m asl)
452
455
458
0
50
100
150
Distance (m)

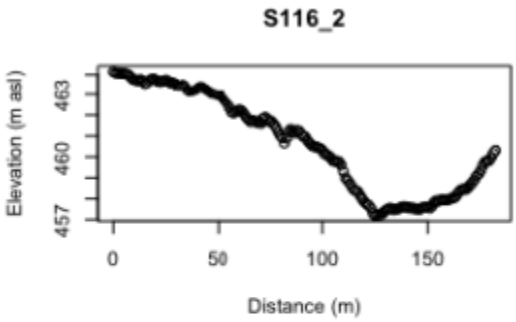

S114_3
Elevation (m asl)
452
455
458
0
20
40
60
80
100
120
140
Distance (m)

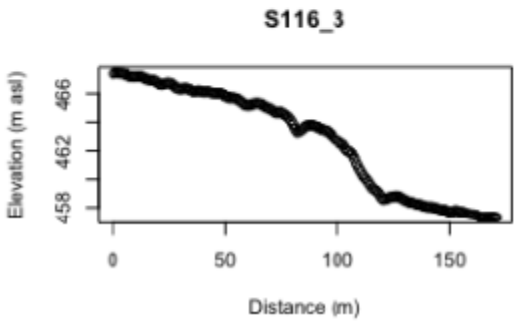

S115
Elevation (m asl)
445
455
0
50
100
150
200
Distance (m)

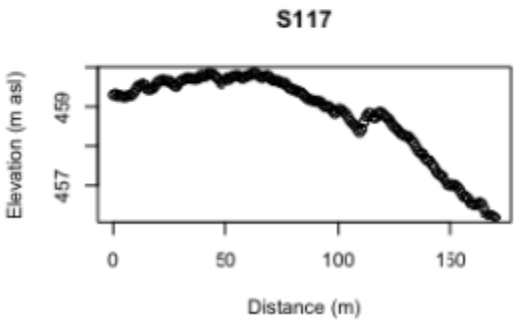

S115_2
Elevation (m asl)
445
455
0
50
100
150
200
Distance (m)

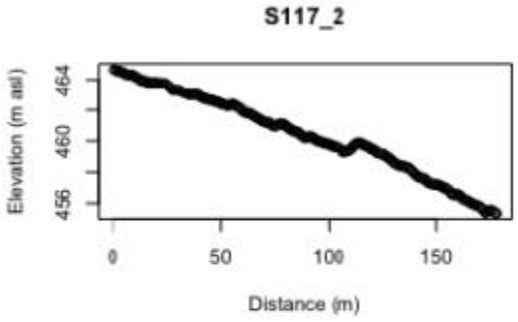

S115_3
Elevation (m asl)
445
455
0
50
100
150
Distance (m)

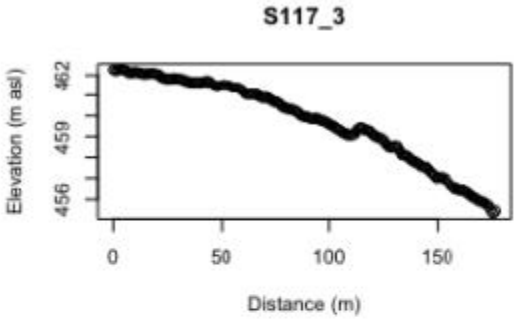

S116
Elevation (m asl)
457
459
461
0
50
100
150
Distance (m)

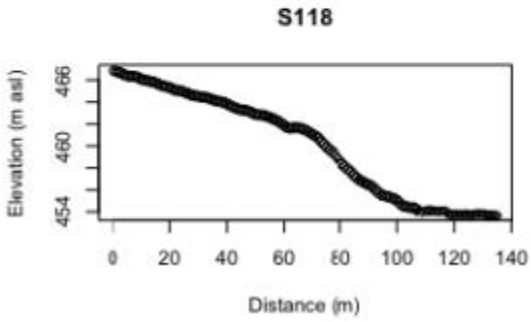

S116_2
Elevation (m asl)
457
460
463
0
50
100
150
Distance (m)

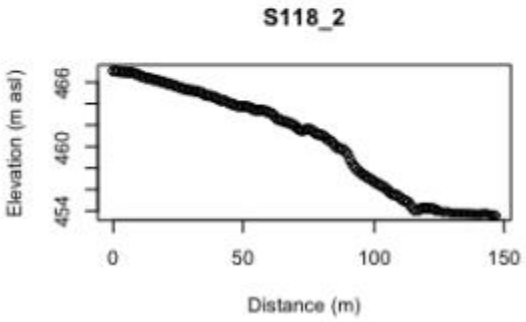

S116_3
Elevation (m asl)
458
462
466
0
50
100
150
Distance (m)

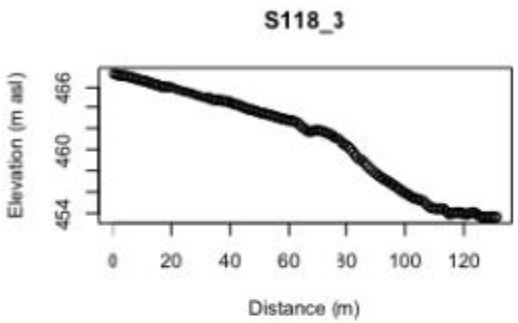

S117
Elevation (m asl)
457
459
0
50
100
150
Distance (m)

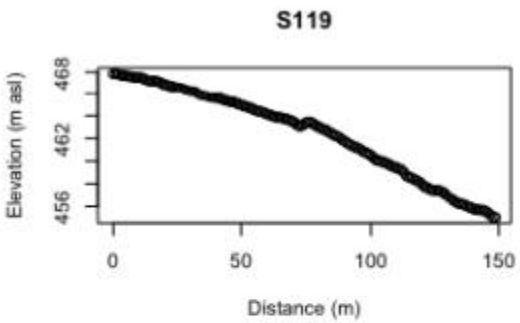

S117_2
Elevation (m asl)
456
460
464
0
50
100
150
Distance (m)

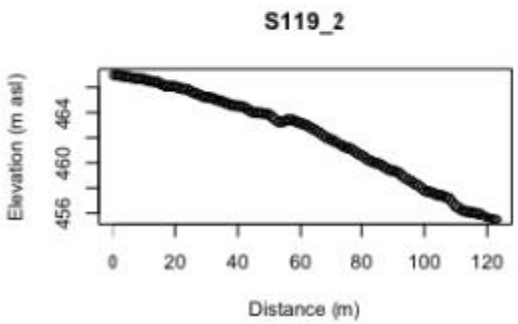

S117_3
Elevation (m asl)
456
459
462
0
50
100
150
Distance (m)

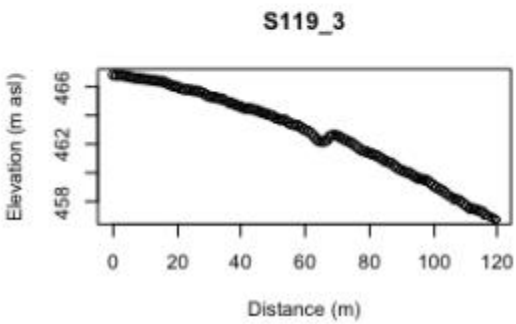

S118
Elevation (m asl)
454
460
466
0
20
40
60
80
100
120
140
Distance (m)

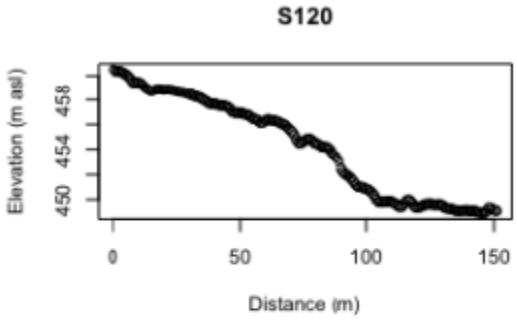

S118_2
Elevation (m asl)
454
460
466
0
50
100
150
Distance (m)

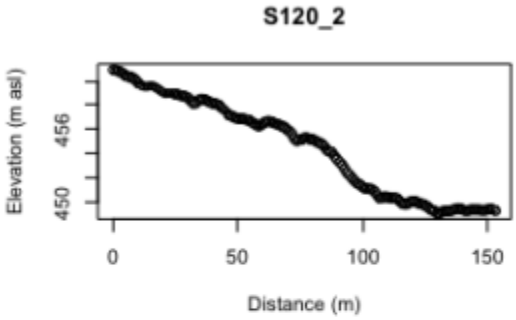

S118_3
Elevation (m asl)
454
460
466
0
20
40
60
80
100
120
Distance (m)

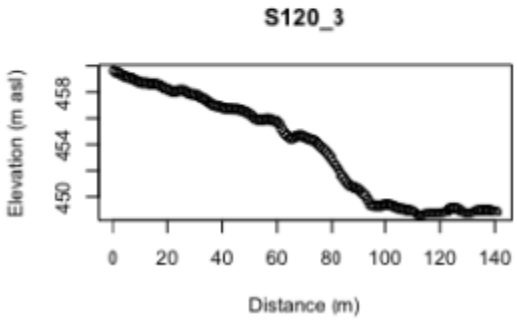

S119
Elevation (m asl)
456
462
468
0
50
100
150
Distance (m)

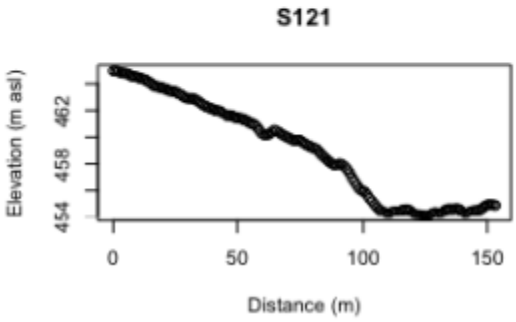

S119_2
Elevation (m asl)
456
460
464
0
20
40
60
80
100
120
Distance (m)

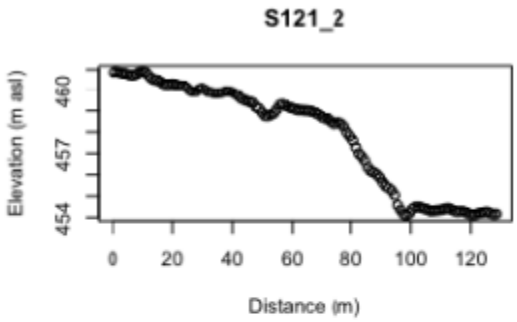

S119_3
Elevation (m asl)
458
462
466
0
20
40
60
80
100
120
Distance (m)

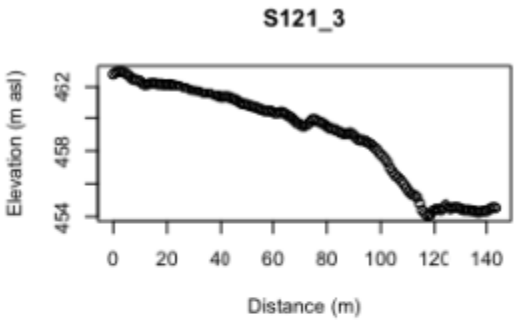

S120
Elevation (m asl)
450
454
458
0
50
100
150
Distance (m)

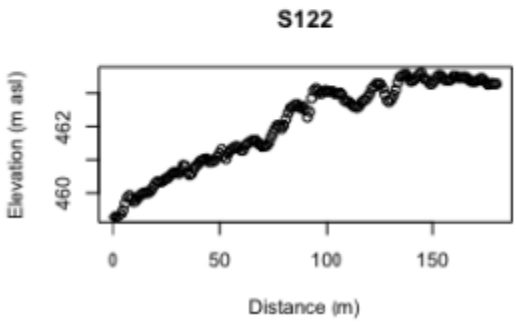

S120_2
Elevation (m asl)
450
456
0
50
100
150
Distance (m)

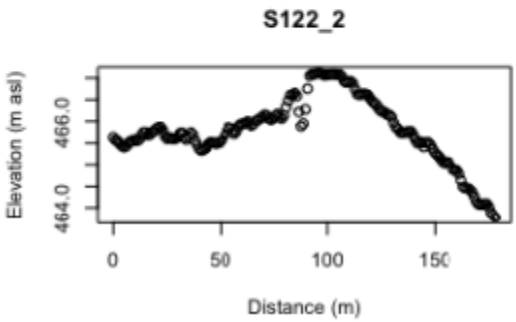

S120_3
Elevation (m asl)
450
454
458
0
20
40
60
80
100
120
140
Distance (m)

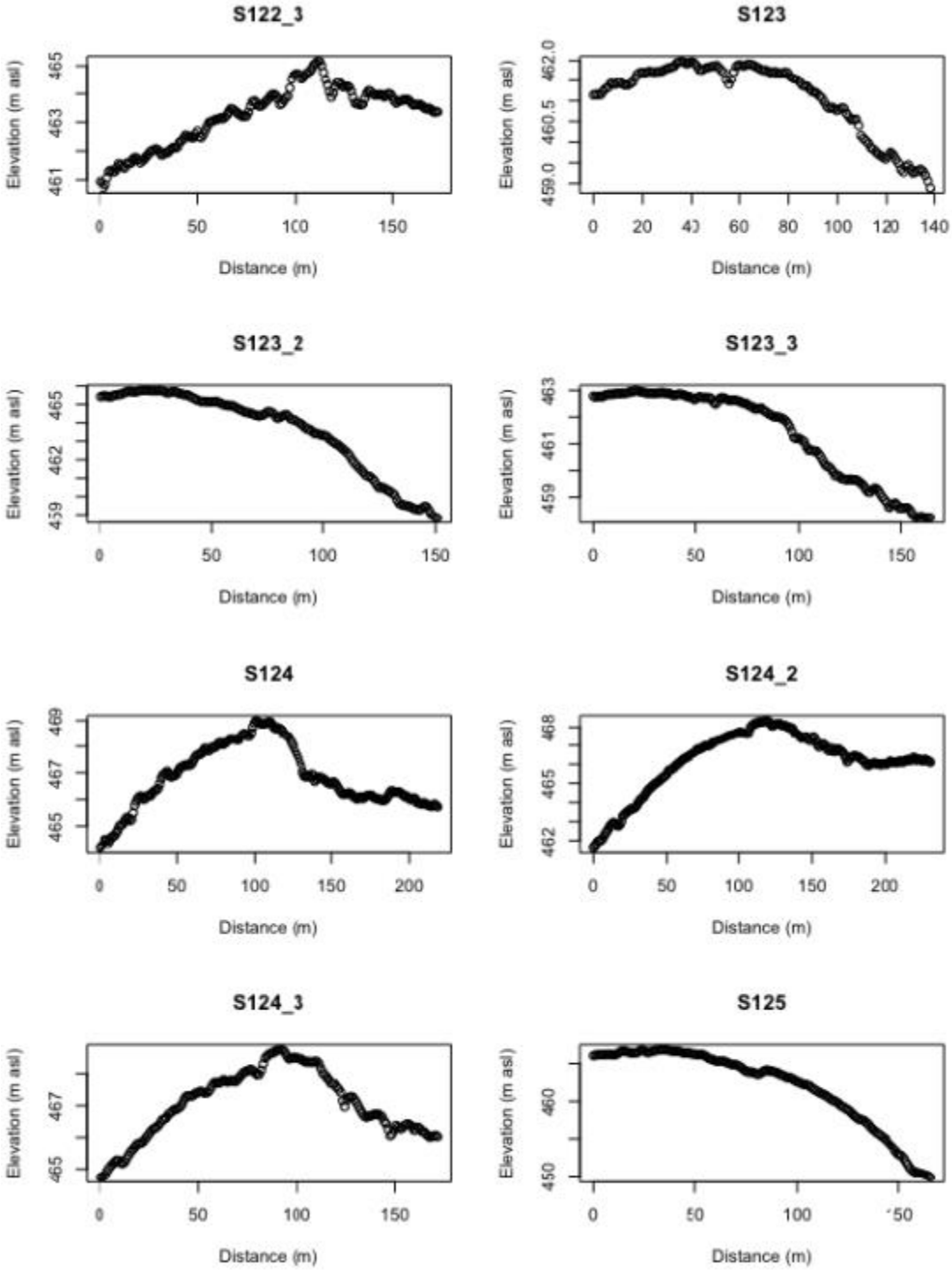

S121
Elevation (m asl)
454
458
462
0
50
100
150
Distance (m)

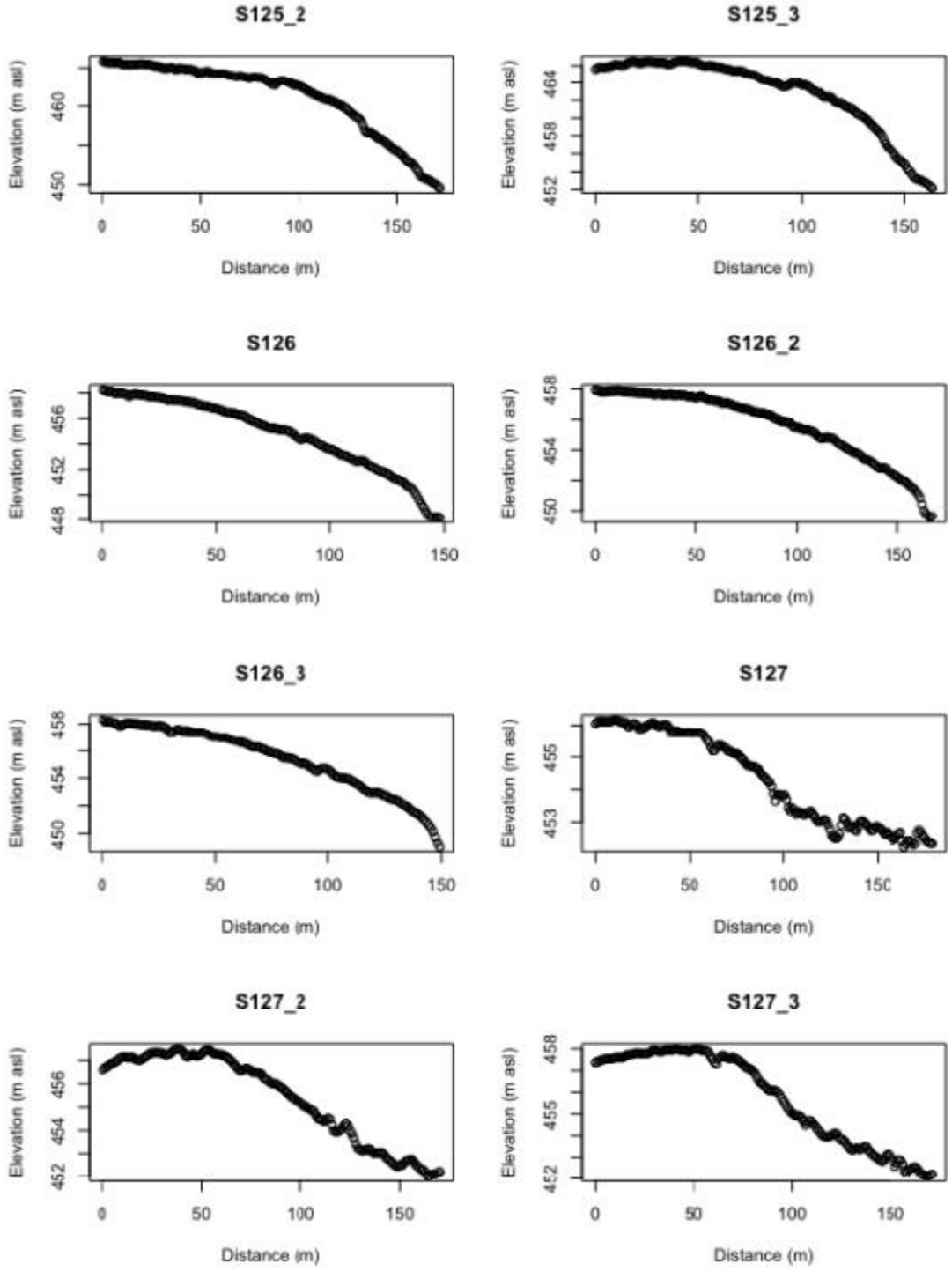

S121_2
Elevation (m asl)
454
457
460
0
20
40
60
80
100
120
Distance (m)

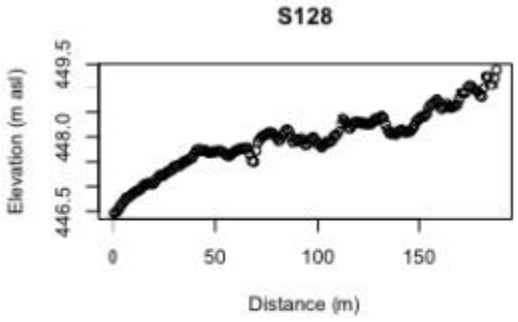

S121_3
Elevation (m asl)
454
458
462
0
20
40
60
80
100
120
140
Distance (m)

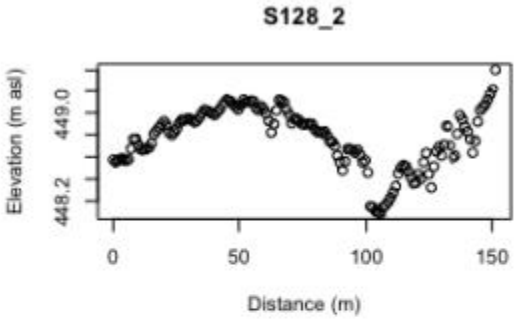

S122
Elevation (m asl)
460
462
0
50
100
150
Distance (m)

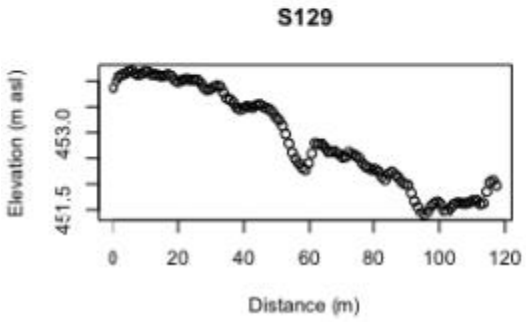

S122_2
Elevation (m asl)
464.0
466.0
0
50
100
150
Distance (m)

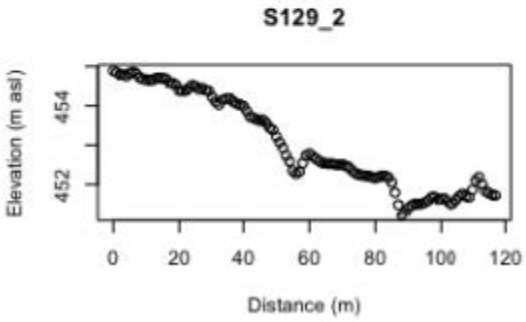

S122_3
Elevation (m asl)
461
463
465
0
50
100
150
Distance (m)
S123
Elevation (m asl)
459.0
460.5
462.0
0
20
40
60
80
100
120
140
Distance (m)
S123_2
Elevation (m asl)
459
462
465
0
50
100
150
Distance (m)
S123_3
Elevation (m asl)
459
461
463
0
50
100
150
Distance (m)
S124
Elevation (m asl)
465
467
469
0
50
100
150
200
Distance (m)
S124_2
Elevation (m asl)
462
465
468
0
50
100
150
200
Distance (m)
S124_3
Elevation (m asl)
465
467
0
50
100
150
Distance (m)
S125
Elevation (m asl)
450
460
0
50
100
150
Distance (m)

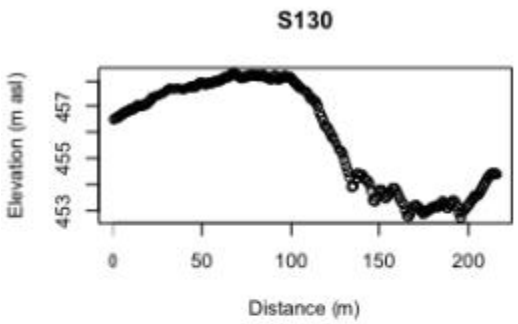

S125_2
Elevation (m asl)
450
460
0
50
100
150
Distance (m)
S125_3
Elevation (m asl)
452
458
464
0
50
100
150
Distance (m)
S126
Elevation (m asl)
448
452
456
0
50
100
150
Distance (m)
S126_2
Elevation (m asl)
450
454
458
0
50
100
150
Distance (m)
S126_3
Elevation (m asl)
450
454
458
0
50
100
150
Distance (m)
S127
Elevation (m asl)
453
455
0
50
100
150
Distance (m)
S127_2
Elevation (m asl)
452
454
456
0
50
100
150
Distance (m)
S127_3
Elevation (m asl)
452
455
458
0
50
100
150
Distance (m)

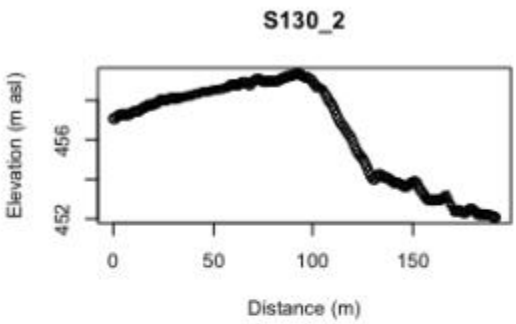

S128
Elevation (m asl)
446.5
448.0
449.5
0
50
100
150
Distance (m)

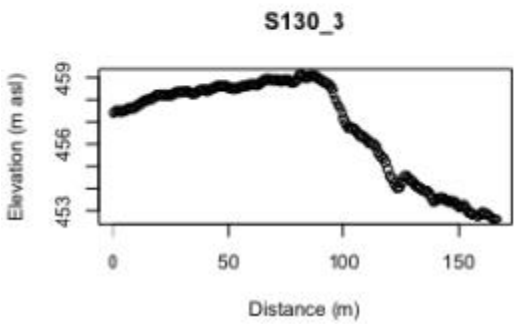

S128_2
Elevation (m asl)
448.2
449.0
0
50
100
150
Distance (m)

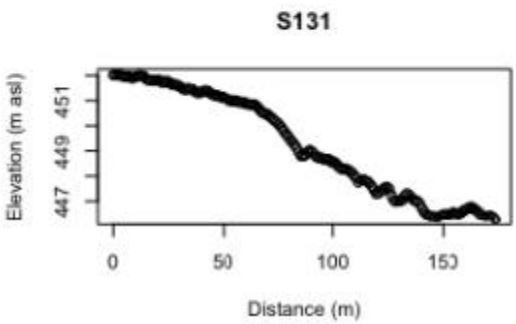

S129
Elevation (m asl)
451.5
453.0
0
20
40
60
80
100
120
Distance (m)

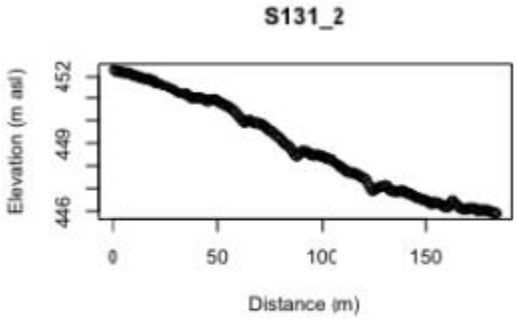

S129_2
Elevation (m asl)
452
454
0
20
40
60
80
100
120
Distance (m)

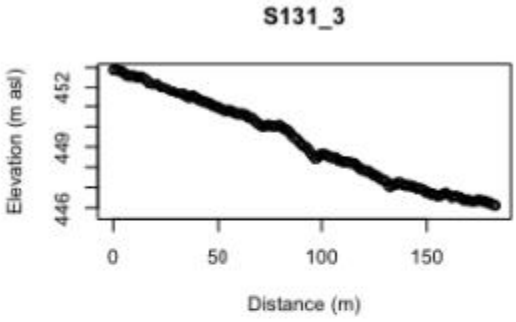

S130
Elevation (m asl)
453
455
457
0
50
100
150
200
Distance (m)

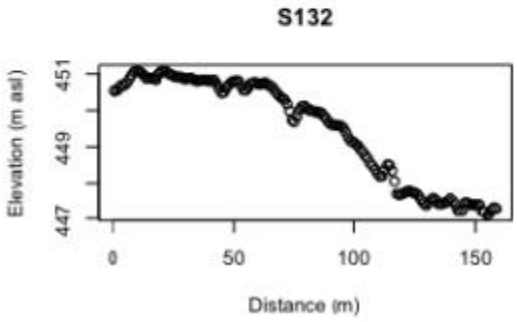

S130_2
Elevation (m asl)
452
456
0
50
100
150
Distance (m)

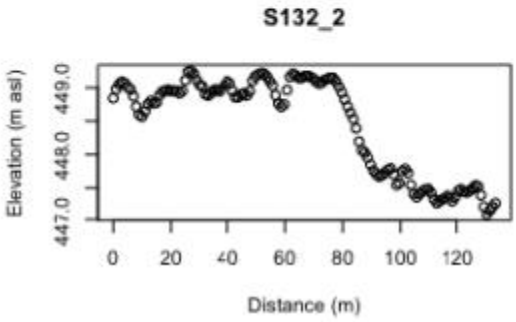

S130_3
Elevation (m asl)
453
456
459
0
50
100
150
Distance (m)

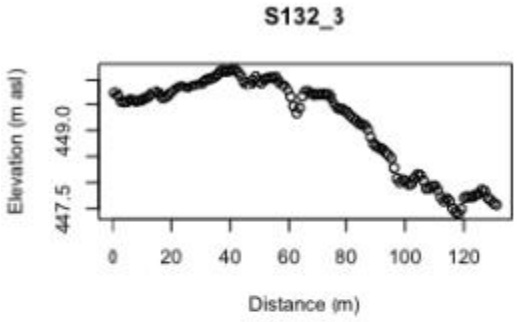

S131
Elevation (m asl)
447
449
451
0
50
100
150
Distance (m)

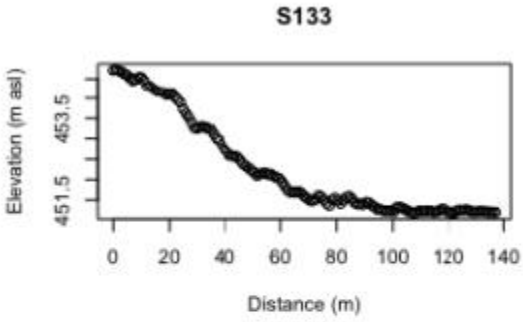

S131_2
Elevation (m asl)
446
449
452
0
50
100
150
Distance (m)

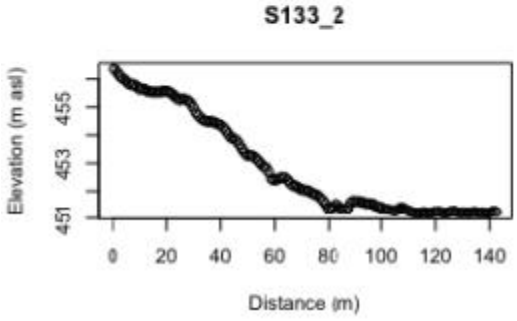

S131_3
Elevation (m asl)
446
449
452
0
50
100
150
Distance (m)

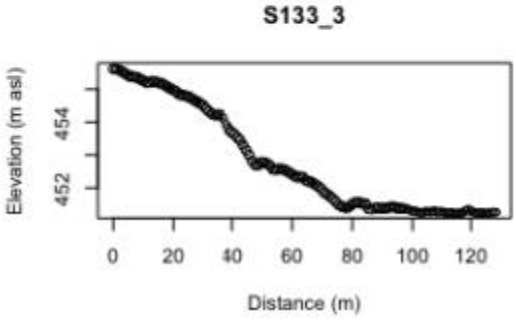

S132
Elevation (m asl)
447
449
451
0
50
100
150
Distance (m)

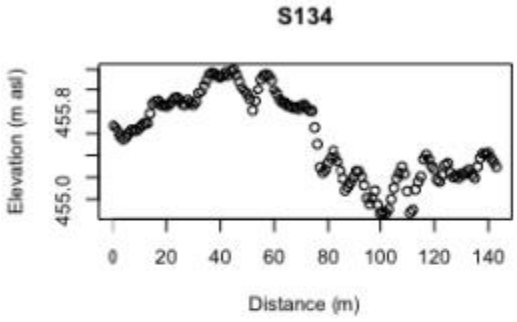

S132_2
Elevation (m asl)
447.0
448.0
449.0
0
20
40
60
80
100
120
Distance (m)

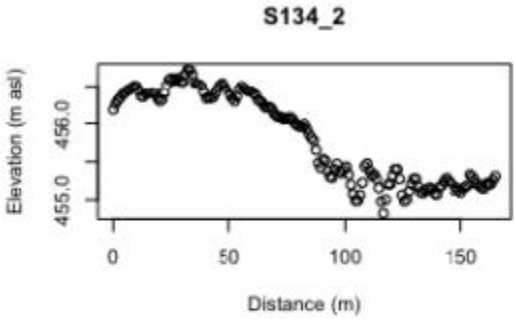

S132_3
Elevation (m asl)
447.5
449.0
0
20
40
60
80
100
120
Distance (m)

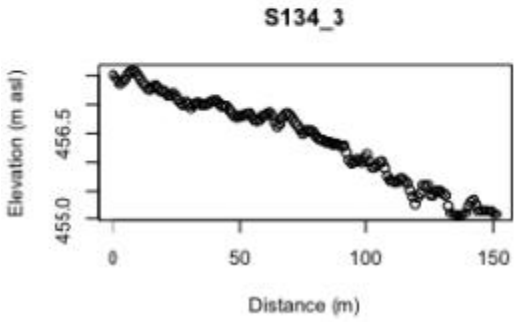

S133
Elevation (m asl)
451.5
453.5
0
20
40
60
80
100
120
140
Distance (m)

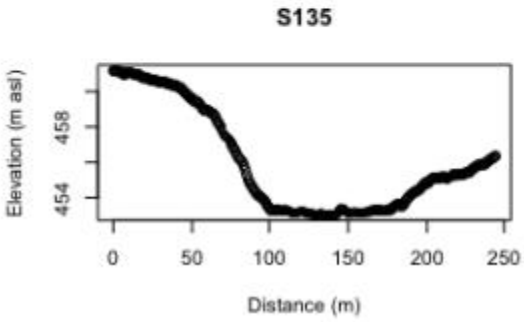

S133_2
Elevation (m asl)
451
453
455
0
20
40
60
80
100
120
140
Distance (m)

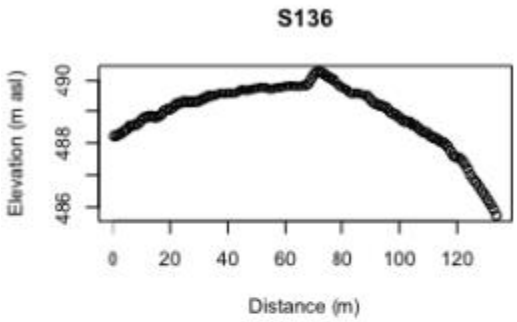

S133_3
Elevation (m asl)
452
454
0
20
40
60
80
100
120
Distance (m)

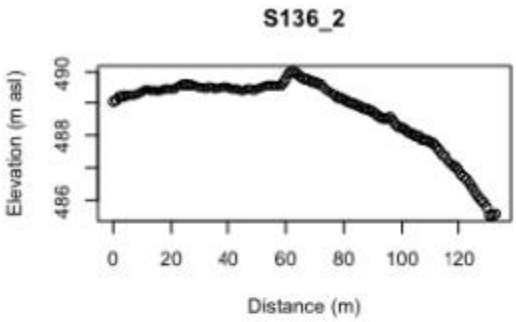

S134
Elevation (m asl)
455.0
455.8
0
20
40
60
80
100
120
140
Distance (m)

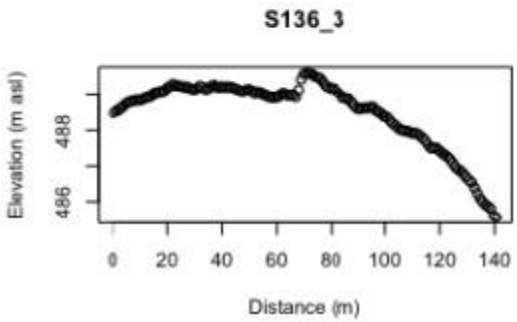

S134_2
Elevation (m asl)
455.0
456.0
0
50
100
150
Distance (m)

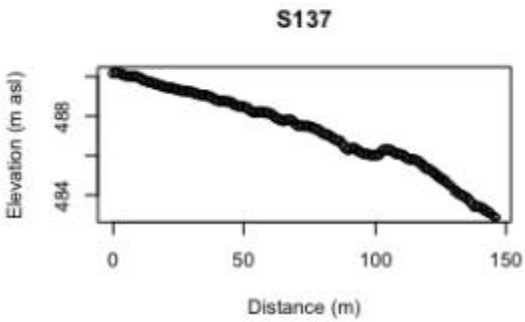

S134_3
Elevation (m asl)
455.0
456.5
0
50
100
150
Distance (m)

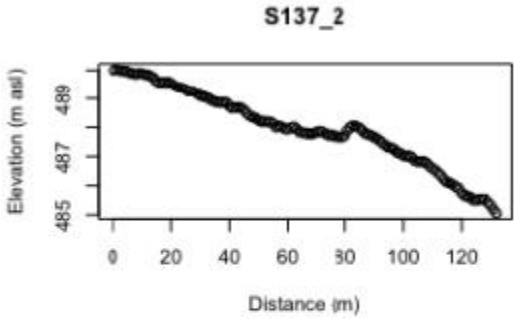

S135
Elevation (m asl)
454
458
0
50
100
150
200
250
Distance (m)

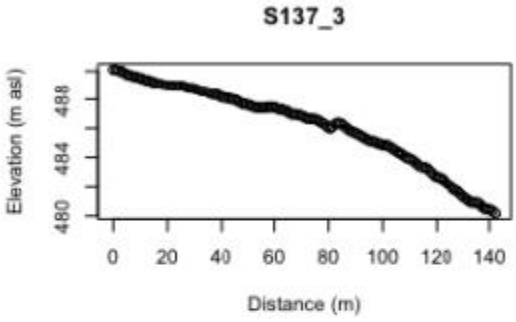

S136
Elevation (m asl)
486
488
490
0
20
40
60
80
100
120
Distance (m)

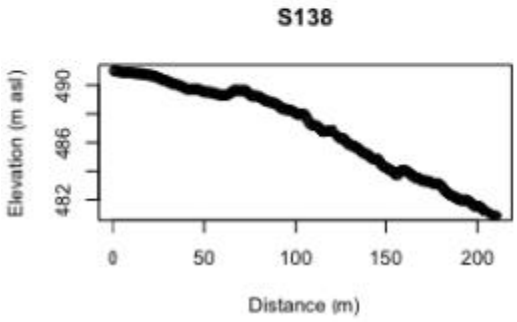

S136_2
Elevation (m asl)
486
488
490
0
20
40
60
80
100
120
Distance (m)

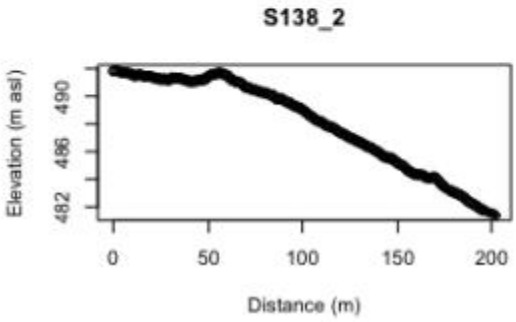

S136_3
Elevation (m asl)
486
488
0
20
40
60
80
100
120
140
Distance (m)

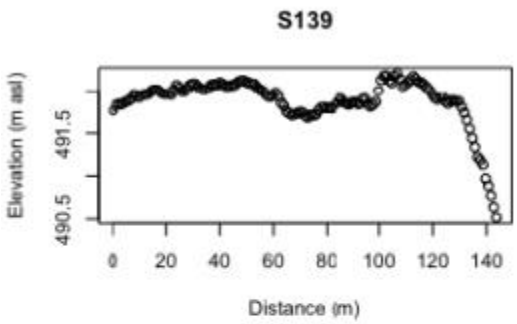

S137
Elevation (m asl)
484
488
0
50
100
150
Distance (m)

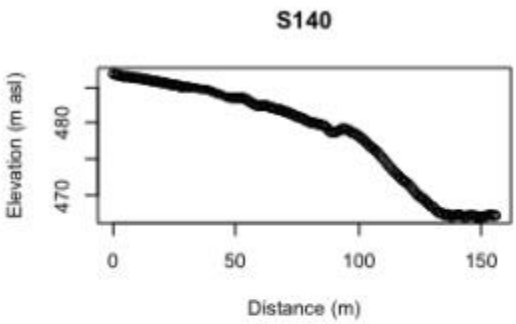

S137_2
Elevation (m asl)
485
487
489
0
20
40
60
80
100
120
Distance (m)

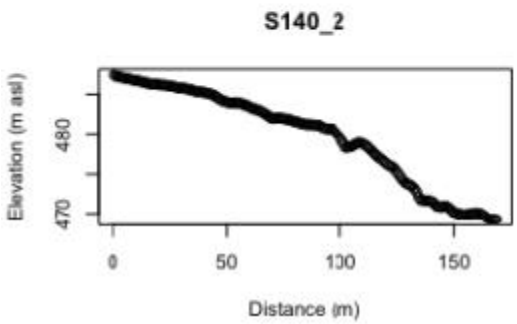

S137_3
Elevation (m asl)
480
484
488
0
20
40
60
80
100
120
140
Distance (m)

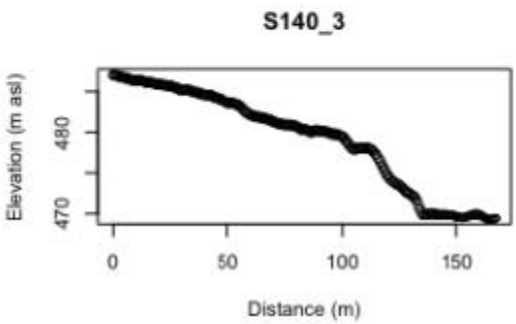

S138
Elevation (m asl)
482
486
490
0
50
100
150
200
Distance (m)

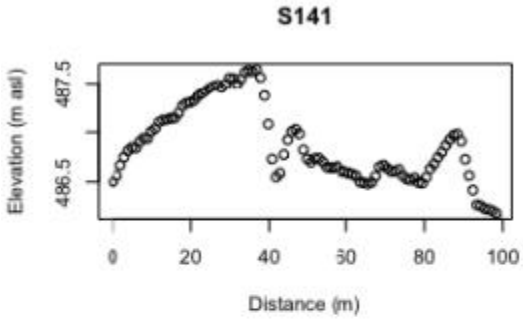

S138_2
Elevation (m asl)
482
486
490
0
50
100
150
200
Distance (m)

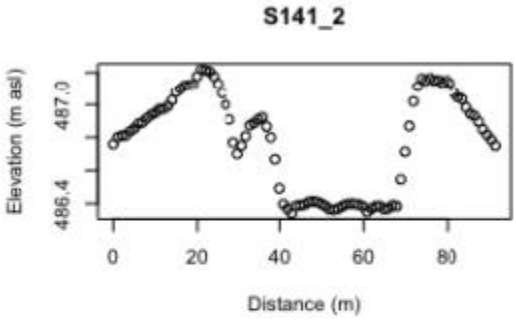

S139
Elevation (m asl)
490.5
491.5
0
20
40
60
80
100
120
140
Distance (m)

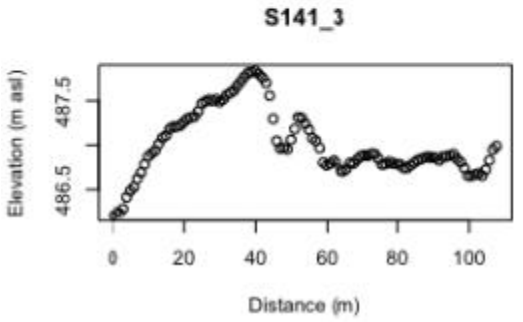

S140
Elevation (m asl)
470
480
0
50
100
150
Distance (m)

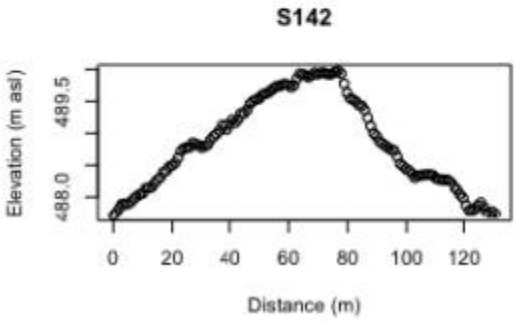

S140_2
Elevation (m asl)
470
480
0
50
100
150
Distance (m)

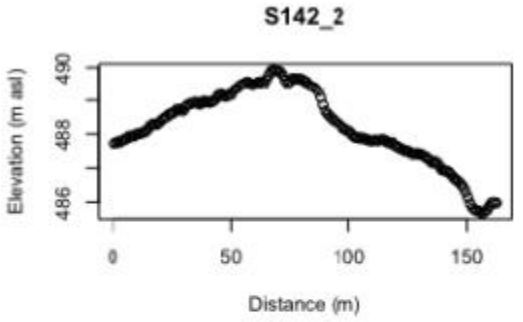

S140_3
Elevation (m asl)
470
480
0
50
100
150
Distance (m)

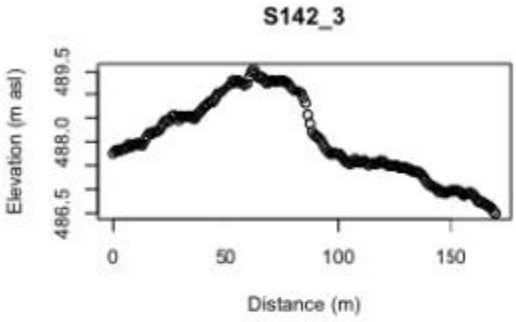

S141
Elevation (m asl)
487.5
486.5
0
20
40
80
100
Distance (m)

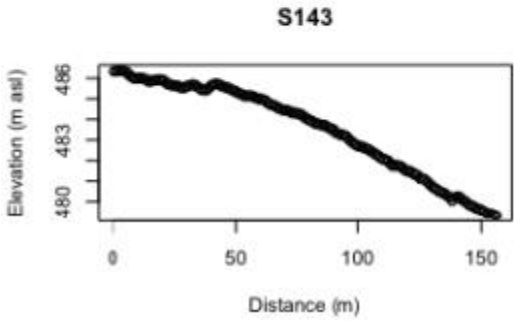

S141_2
Elevation (m asl)
487.0
486.4
0
20
40
60
80
Distance (m)

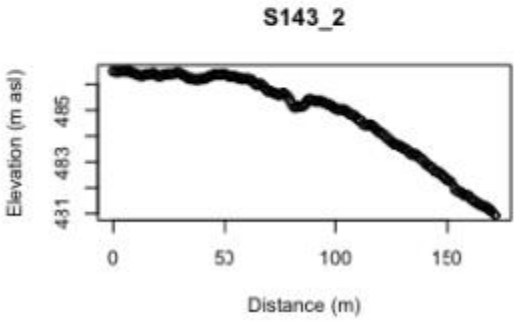

S141_3
Elevation (m asl)
487.5
486.5
0
20
40
60
80
100
Distance (m)

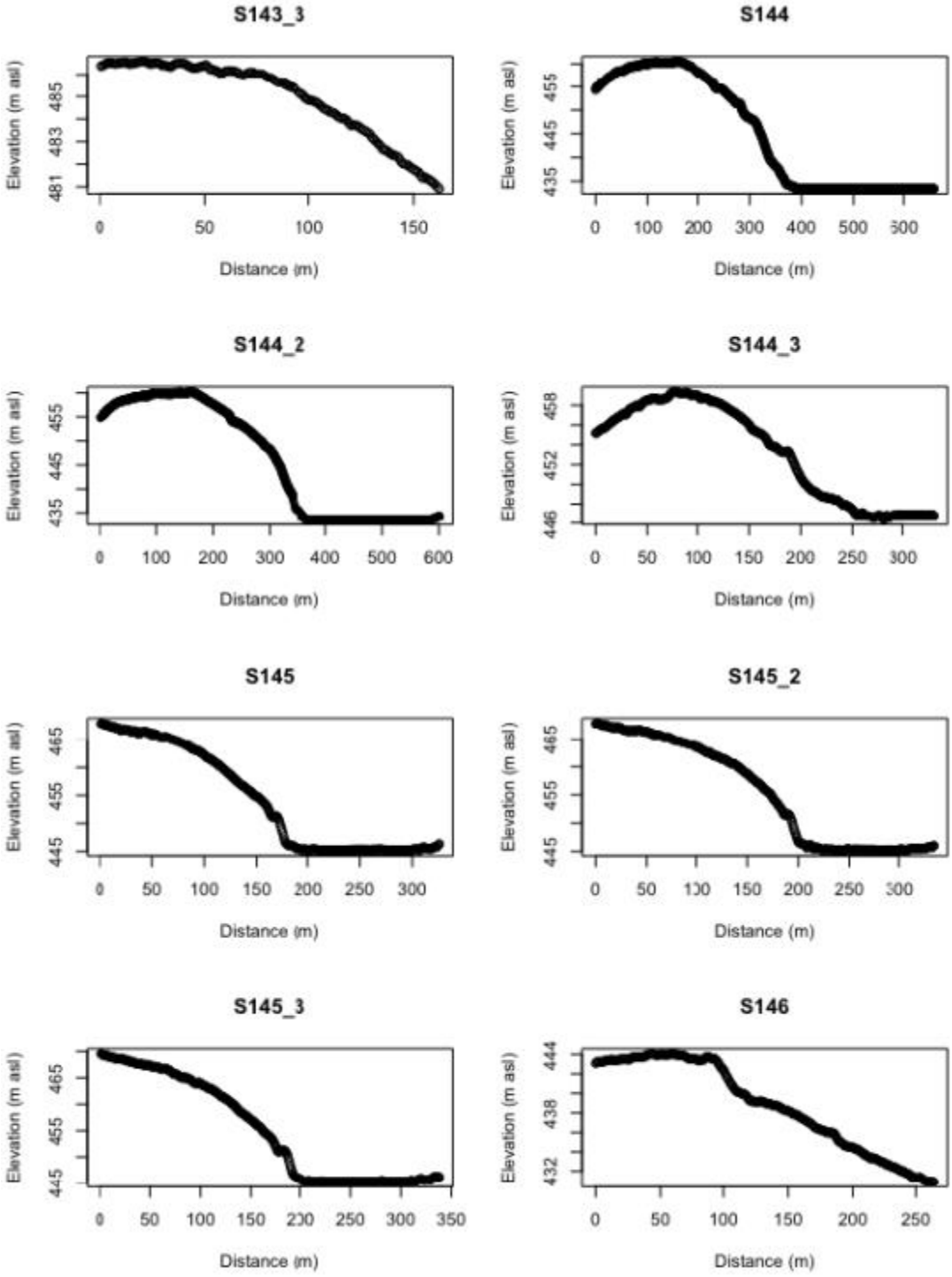

S142
Elevation (m asl)
489.5
488.0
0
20
40
60
80
100
120
Distance (m)

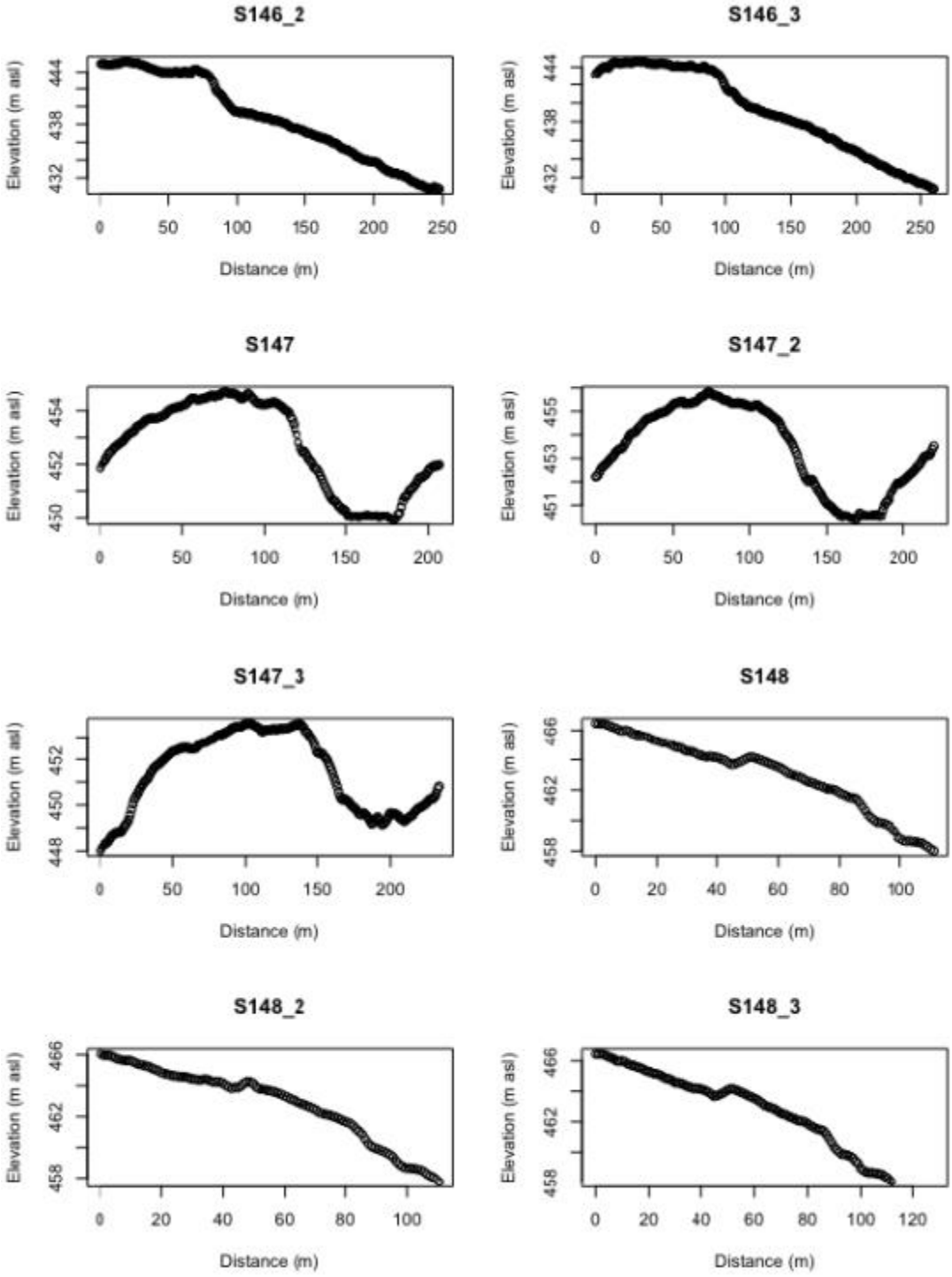

S142_2
Elevation (m asl)
490
488
486
0
50
100
150
Distance (m)

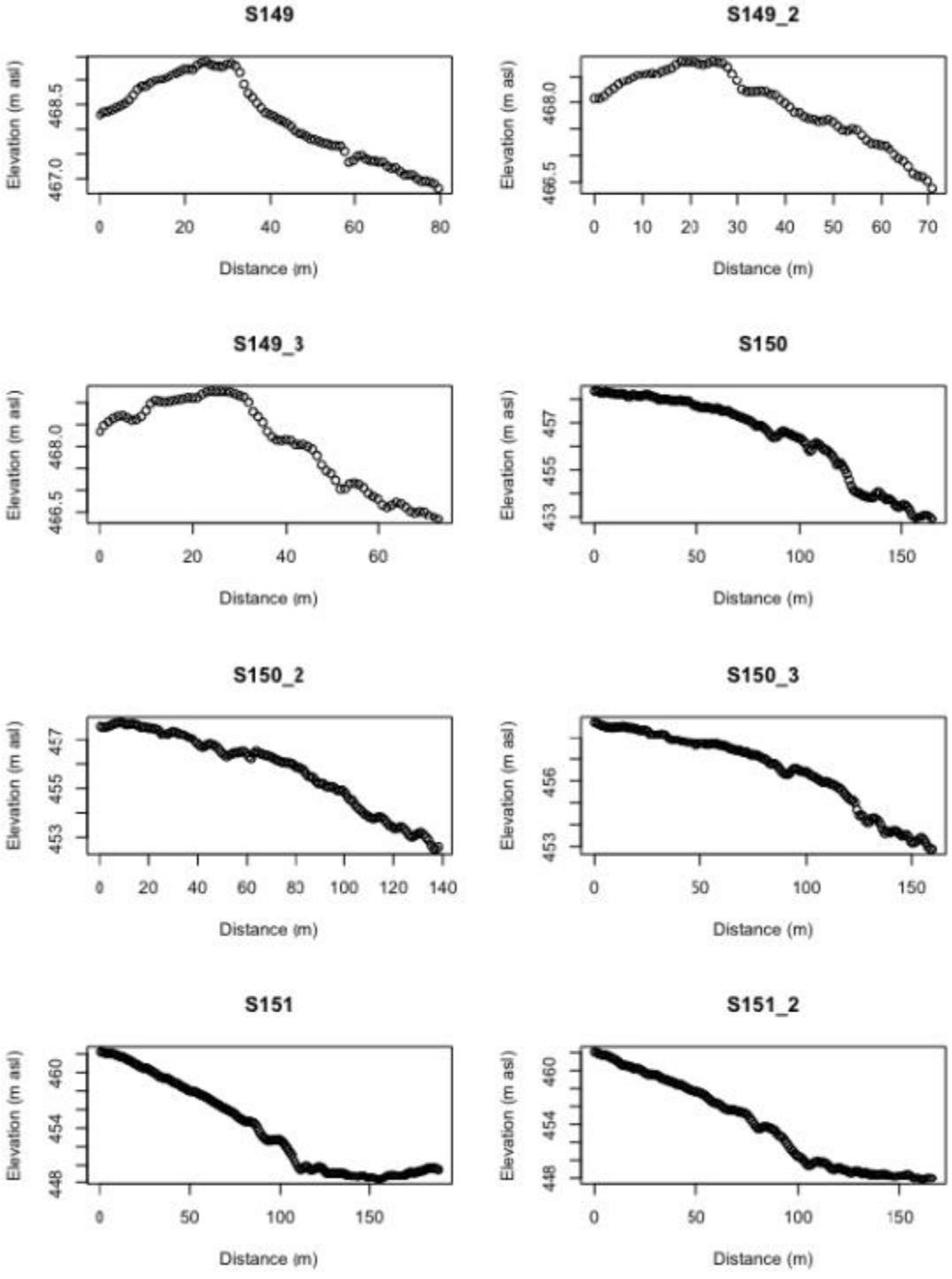

S142_3
Elevation (m asl)
489.5
488.0
486.5
0
50
100
150
Distance (m)


S143
Elevation (m asl)
486
483
480
0
50
100
150
Distance (m)


S143_2
Elevation (m asl)
485
483
431
0
50
100
150
Distance (m)


S143_3
Elevation (m asl)
481 483 485
0 50 100 150
Distance (m)
S144
Elevation (m asl)
435 445 455
0 100 200 300 400 500 600
Distance (m)
S144_2
Elevation (m asl)
435 445 455
0 100 200 300 400 500 600
Distance (m)
S144_3
Elevation (m asl)
446 452 458
0 50 100 150 200 250 300
Distance (m)
S145
Elevation (m asl)
445 455 465
0 50 100 150 200 250 300
Distance (m)
S145_2
Elevation (m asl)
445 455 465
0 50 100 150 200 250 300
Distance (m)
S145_3
Elevation (m asl)
445 455 465
0 50 100 150 200 250 300 350
Distance (m)
S146
Elevation (m asl)
432 438 444
0 50 100 150 200 250
Distance (m)


S146_2
Elevation (m asl)
Distance (m)
S146_3
Elevation (m asl)
Distance (m)
S147
Elevation (m asl)
Distance (m)
S147_2
Elevation (m asl)
Distance (m)
S147_3
Elevation (m asl)
Distance (m)
S148
Elevation (m asl)
Distance (m)
S148_2
Elevation (m asl)
Distance (m)
S148_3
Elevation (m asl)
Distance (m)


S149
Elevation (m asl)
467.0
468.5
0
20
40
60
80
Distance (m)
S149_2
Elevation (m asl)
466.5
468.0
0
10
20
30
40
50
60
70
Distance (m)
S149_3
Elevation (m asl)
466.5
468.0
0
20
40
60
Distance (m)
S150
Elevation (m asl)
453
455
457
0
50
100
150
Distance (m)
S150_2
Elevation (m asl)
453
455
457
0
20
40
60
80
100
120
140
Distance (m)
S150_3
Elevation (m asl)
453
456
0
50
100
150
Distance (m)
S151
Elevation (m asl)
448
454
460
0
50
100
150
Distance (m)
S151_2
Elevation (m asl)
448
454
460
0
50
100
150
Distance (m)

APPENDIX B – RAW DATA

Variable Label	Label Definition
SITE_ID	Unique Identifier for each feature
POINT_X	The Easting (X) value of the site coordinates
POINT_Y	The Northing (Y) value of the site coordinates measured
CLASS	1- pioneer slump, 2-succeeding slump, 3- remnant slump
TOT_LENGTH	The total length of the feature in plan view, measured in metres
TOT_HEIGHT	The total height of the feature, from parent terrain to footslope, measure in metres
TMIN	The minimum elevation value associated with the trough feature, measured in metres
TMAX	The maximum elevation value associated with the trough feature, measured in metres
TROUGH_DEPTH	The maximum elevation value of the trough minus the minimum value to calculate the over all depth of the feature in metres
TROUGH_WIDTH	The distance from the trough maximum to the ridge edge, given a maximum width of the trough in metres
PAR_X	The X value of the elevation of the parent terrain, measured in metres above sea level, this is a rounded average of the parent elevation
PAR_Y	The Y value of the elevation of the parent terrain, measured in metres above sea level and rounded to the nearest metre
RMAX_X	The X value associated with the highest point of the ridge, measured in metres
RMAX_Y	The Y value associated with the highest point of the ridge, measured in metres
RMIN_X	The X value associated with the lowest point of the hillslope, where the foot slope measured in metres
RMIN_Y	The Y value associated with the lowest point of the hillslope, where the foot slope measure in metres
P_FS_DIFF	The total length of the feature transect from parent terrain to footslope, measured in
HS_SLOPE	The calculated hillslope of the feature displayed in %
HS_DEGREES	The calculated hillslope of the feature displayed in degrees
ASPECT	The average direction the scarp of the feature is facing, a binned value since the feature is a curve and at any given point it is facing a different direction (North, North-East, East, South-East, South, South-West, West, North-West)
VEG_PARENT	The presence of vegetation on the parent surface (Yes or No)
VEG_TROUGH	The presence of vegetation in the trough of the feature (Yes or No)
VEG_RIDGE	The presence of vegetation on the ridge (Yes or No)
VEG_HS	The presence of vegetation on the hillslope (Yes or No)
VEG_FS	The presence of vegetation on the foot slope (Yes or No)
WATER	The presence of water within 50 m of the ridge (Yes or No)
WATER_FS	The presence of water at the foot slope and within 50 m of the ridge (Yes or No)
WATER_P	The presence of water on the parent material and within 50 m of the ridge (Yes or No)
WATER_TR	The presence of water in the trough and within 50 m of the ridge (Yes or No)

SITE_ID	POINT_X	POINT_Y	CLASS	TOT_LENGTH	TOT_HEIGHT	TMIN	TMAX	TROUGH_DEPTH
S01	511883.4	7169257	3	126	0.4218	NA	NA	NA
S02	511600	7168211	2	298	0.806	457.8	458.2	0.4011
S03	511623.6	7167857	3	198	2.227	NA	NA	NA
S04	511818.8	7167946	1	108	9.9818	462.1	462.8	0.6424
S05	511861	7168037	3	136	6.6314	NA	NA	NA
S06	512274.3	7167977	1	176	12.5185	459.8	460.7	0.8996
S07	512677.4	7168290	1	101	5.054	457.5	458.1	0.6231
S08	512689.2	7168234	2	56	1.5068	458	459	0.9948
S09	512758.3	7168242	2	74	2.0036	460.3	461	0.6666
S10	512849.2	7168297	2	102	2.1539	460.4	461.1	0.7307
S100	534012.2	7162274	3	91	2.8607	NA	NA	NA
S100_02	534012.2	7162274	3	91	4.1217	NA	NA	NA
S100_03	534012.2	7162274	3	91	4.3894	NA	NA	NA
S101	533992.2	7162085	1	309	5.082	483.9	484.3	0.3701
S101_02	533992.2	7162085	1	309	4.9994	483	483.3	0.2761
S101_03	533992.2	7162085	1	309	5.1776	483.2	483.6	0.3529
S102	528852.8	7163547	3	241	0.2418	NA	NA	NA
S103	519194	7168834	3	114	0.1478	NA	NA	NA
S103_02	519194	7168834	3	114	0.9424	NA	NA	NA
S104	520164.8	7169569	1	90	7.0701	447.4	447.5	0.1818
S104_02	520164.8	7169569	1	90	7.1147	447	447.2	0.1572
S104_03	520164.8	7169569	1	90	7.9341	447.5	447.6	0.047
S105	520094.9	7169604	1	59	4.7578	445.6	445.7	0.112
S105_02	520094.9	7169604	1	59	4.3481	445	445.1	0.1123
S106	520025.9	7169457	2	315	3.7226	449.6	450.2	0.5803
S107	520000.5	7169658	1	78	7.6798	445	445.3	0.2629
S107_02	520000.5	7169658	1	78	6.6157	444.4	444.8	0.3775
S107_03	520000.5	7169658	1	78	7.6971	444.8	445.4	0.5615
S108	512788	7167421	3	117	1.2464	NA	NA	NA
S108_02	512788	7167421	3	117	3.4571	NA	NA	NA
S109	512828.5	7168446	3	75	1.8631	NA	NA	NA
S11	549445.5	7187806	1	115	8.2355	454.3	454.7	0.3975
S11_02	549445.5	7187806	1	115	8.3287	452.9	453.2	0.3246
S11_03	549445.5	7187806	1	115	8.66	454.2	454.5	0.2811
S110	548897.4	7187228	1	124	12.1238	462.3	462.6	0.2491
S110_02	548897.4	7187228	1	124	9.7739	462.2	462.3	0.0774
S110_03	548897.4	7187228	1	124	15.1212	464.1	464.3	0.184
S111	555683.6	7175100	3	239	0.9524	NA	NA	NA
S111_02	555683.6	7175100	3	239	5.4406	NA	NA	NA
S111_03	555683.6	7175100	3	239	5.9506	NA	NA	NA
S112	553533.6	7182672	1	266	7.4214	471.1	471.5	0.4282
S112_02	553533.6	7182672	1	266	7.0652	472.8	473.5	0.71
S112_03	553533.6	7182672	1	266	8.8738	475.8	476	0.2904
S113	552017.5	7184314	1	131	13.7168	460.7	461.6	0.9063
S113_02	552017.5	7184314	1	131	13.808	461.6	462	0.3738
S113_03	552017.5	7184314	1	131	14.8498	460.9	461.6	0.6482

SITE_ID	POINT_X	POINT_Y	CLASS	TOT_LENGTH	TOT_HEIGHT	TMIN	TMAX	TROUGH_DEPTH
S114	548615.8	7188772	1	279	3.6554	456.6	456.7	0.1853
S114_02	548615.8	7188772	1	279	4.6641	456.9	457	0.111
S114_03	548615.8	7188772	1	279	3.7108	457.5	457.7	0.156
S115	549408.7	7187705	1	160	14.8858	455.6	455.8	0.2792
S115_02	549408.7	7187705	1	160	13.8683	454.7	455.4	0.6715
S115_03	549408.7	7187705	1	160	13.53	454.6	454.8	0.2846
S116	548725.5	7187185	1	112	4.3456	459.2	459.6	0.4013
S116_02	548725.5	7187185	1	112	5.7937	460.7	461.4	0.7618
S116_03	548725.5	7187185	1	112	7.4182	463.3	463.9	0.5628
S117	549082.7	7187108	1	78	3.4467	458.7	458.8	0.1138
S117_02	549082.7	7187108	1	78	6.6027	459.3	459.6	0.2928
S117_03	549082.7	7187108	1	78	6.6682	459.1	459.4	0.2924
S118	548985.1	7187242	1	43	11.0999	461.6	461.9	0.269
S118_02	548985.1	7187242	1	43	9.9984	461.5	461.7	0.1887
S118_03	548985.1	7187242	1	43	11.0891	461.7	461.9	0.2026
S119	549016.8	7187282	1	77	10.9168	463.1	463.3	0.2756
S119_02	549016.8	7187282	1	77	8.6272	463.3	463.4	0.1589
S119_03	549016.8	7187282	1	77	7.4809	462.2	462.9	0.7507
S12	511971.3	7167745	1	57	9.2531	469.9	470.9	0.9857
S120	548545.1	7187030	1	145	8.4205	454.5	454.8	0.2942
S120_02	548545.1	7187030	1	145	7.6622	455	455.2	0.1949
S120_03	548545.1	7187030	1	145	8.6019	454.7	455.6	0.906
S121	548491.1	7187160	1	81	8.7815	460.2	460.5	0.3519
S121_02	548491.1	7187160	1	81	5.8976	458.8	459.4	0.6669
S121_03	548491.1	7187160	1	81	6.9248	459.5	460	0.5293
S122	549326.4	7187825	2	147	1.6081	462.3	462.8	0.5738
S122_02	549326.4	7187825	2	147	1.9114	465.9	466.7	0.7695
S122_03	549326.4	7187825	2	147	0.3842	464.6	464.7	0.1545
S123	548295	7188007	2	250	2.367	461.4	461.9	0.4813
S123_02	548295	7188007	2	250	5.6839	464.3	464.4	0.1624
S123_03	548295	7188007	2	250	3.8398	462.5	462.7	0.2444
S124	549201	7187730	1	115	0.1549	468.9	469	0.1259
S124_02	549201	7187730	1	115	4.2343	468.1	468.1	0.0752
S124_03	549201	7187730	1	115	1.8055	468	468.1	0.1399
S125	549368.3	7187089	1	156	14.1484	463.6	463.9	0.3039
S125_02	549368.3	7187089	1	156	8.3615	462.8	463.4	0.6664
S125_03	549368.3	7187089	1	156	12.7764	463.6	464	0.4067
S126	547895.4	7187036	1	169	8.6356	454.4	454.8	0.4839
S126_02	547895.4	7187036	1	169	7.4722	454.8	454.9	0.105
S126_03	547895.4	7187036	1	169	10.9576	454.5	454.8	0.297
S127	548445.1	7189157	1	188	2.3594	455.2	455.3	0.1053
S127_02	548445.1	7189157	1	188	3.0706	456.6	456.7	0.0973
S127_03	548445.1	7189157	1	188	4.0105	457.3	457.7	0.3683
S128	548903.9	7188963	2	107	0.4982	447.9	448.1	0.173
S128_02	548903.9	7188963	1	107	0.9109	448.8	449.1	0.2359
S129	548665.8	7188889	2	85	1.7249	453.4	453.5	0.044

SITE_ID	POINT_X	POINT_Y	CLASS	TOT_LENGTH	TOT_HEIGHT	TMIN	TMAX	TROUGH_DEPTH
S129_02	548665.8	7188889	2	85	2.7297	454	454.2	0.1957
S13	512007.4	7167717	3	66	7.948	NA	NA	NA
S130	548540.4	7188784	3	239	4.0864	NA	NA	NA
S130_02	548540.4	7188784	3	239	4.0042	NA	NA	NA
S130_03	548540.4	7188784	3	239	3.9654	NA	NA	NA
S131	548788	7188649	1	215	3.1947	451.3	451.4	0.1329
S131_02	548788	7188649	1	215	5.1004	450.9	451	0.092
S131_03	548788	7188649	1	215	3.9727	450	450.1	0.1355
S132	548835.7	7188790	1	76	3.3111	449.7	450.2	0.484
S132_02	548835.7	7188790	1	76	2.2972	449.1	449.2	0.1013
S132_03	548835.7	7188790	1	76	2.0006	449.3	449.8	0.4582
S133	548586.4	7188874	1	86	2.5122	453.2	453.4	0.1479
S133_02	548586.4	7188874	1	86	4.6265	455.3	455.5	0.225
S133_03	548586.4	7188874	1	86	3.3106	454.2	454.3	0.0394
S134	548384.8	7189174	1	131	0.757	455.8	456.2	0.3873
S134_02	548384.8	7189174	1	131	2.0101	456.3	456.5	0.2467
S134_03	548384.8	7189174	1	131	1.7206	456.6	456.9	0.2479
S135	548227.6	7189151	1	114	7.6822	459.1	460	0.8452
S136	540798.4	7198526	3	128	2.2317	NA	NA	NA
S136_02	540798.4	7198526	3	128	2.3434	NA	NA	NA
S136_03	540798.4	7198526	3	128	2.8988	NA	NA	NA
S137	540828	7198648	1	162	6.1726	486	486.3	0.3138
S137_02	540828	7198648	1	162	3.4788	487.7	487.7	0.0842
S137_03	540828	7198648	1	162	8.1495	486	486.4	0.4013
S138	541056.6	7198556	3	124	6.243	NA	NA	NA
S138_02	541056.6	7198556	3	124	7.8246	NA	NA	NA
S139	541004.8	7198472	2	186	1.4824	491.8	491.9	0.0932
S14	511928.4	7167742	1	53	9.6068	466.6	467.5	0.9644
S140	533676.7	7162507	1	116	17.6933	478.6	479.3	0.6557
S140_02	533676.7	7162507	1	116	15.1221	478.4	479.9	1.5801
S140_03	533676.7	7162507	1	116	14.2363	477.9	478	0.1033
S141	540666.1	7198544	3	72	1.4504	NA	NA	NA
S141_02	540666.1	7198544	3	72	0.6586	NA	NA	NA
S141_03	540666.1	7198544	3	72	1.2261	NA	NA	NA
S142	540544.4	7198838	3	126	0.6944	NA	NA	NA
S142_02	540544.4	7198838	3	126	1.0898	NA	NA	NA
S142_03	540544.4	7198838	3	126	0.4538	NA	NA	NA
S143	540528.5	7198506	1	120	5.9479	485.4	485.7	0.2765
S143_02	540528.5	7198506	1	120	4.8986	485.1	485.4	0.2784
S143_03	540528.5	7198506	1	120	4.6096	485.9	486.1	0.1417
S144	556262.5	7175232	1	110	25.4099	459.5	459.5	0.0564
S144_02	556262.5	7175232	1	110	23.9799	459.9	460	0.1744
S144_03	556262.5	7175232	1	110	12.1879	453.3	453.4	0.0495
S145	556205.3	7175835	1	136	14.4951	451.1	451.4	0.2857
S145_02	556205.3	7175835	1	136	15.1632	451.4	451.7	0.2514
S145_03	556205.3	7175835	1	136	17.5994	451	451.3	0.3552

SITE_ID	POINT_X	POINT_Y	CLASS	TOT_LENGTH	TOT_HEIGHT	TMIN	TMAX	TROUGH_DEPTH
S146	555531.2	7175139	1	75	4.8133	443.3	443.5	0.1919
S146_02	555531.2	7175139	1	75	5.5916	443.7	444.1	0.3705
S146_03	555531.2	7175139	1	75	5.7556	443.9	444.1	0.2751
S147	555975.7	7175364	1	170	4.9363	452.5	452.6	0.1206
S147_02	555975.7	7175364	1	170	5.4603	452	452.2	0.1778
S147_03	555975.7	7175364	1	170	3.7445	452.3	452.6	0.2926
S148	549048.9	7187375	1	62	6.1385	463.7	464	0.3445
S148_02	549048.9	7187375	1	62	4.9282	463.8	464.2	0.4095
S148_03	549048.9	7187375	1	62	6.3411	463.5	463.8	0.3517
S149	548892.9	7187299	1	201	1.6662	469.3	469.4	0.1041
S149_02	548892.9	7187299	1	201	0.5222	468.7	468.8	0.048
S149_03	548892.9	7187299	1	201	0.0357	469.1	469.1	0.0097
S15	511948.6	7167712	2	92	0.4627	471.5	472	0.4366
S150	548440	7189247	1	107	5.0246	455.8	456.1	0.3256
S150_02	548440	7189247	1	107	3.1796	456.2	456.5	0.2384
S150_03	548440	7189247	1	107	3.9114	456.3	456.5	0.2059
S151	549614	7186931	1	148	9.44	452.7	452.8	0.111
S151_02	549614	7186931	1	148	9.6023	453.5	453.7	0.2038
S151_03	549614	7186931	1	148	9.1668	451.6	452.1	0.4645
S152	511644.4	7167326	1	220	10.3989	475.3	475.8	0.5354
S152_02	511644.4	7167326	1	220	12.876	476.6	477.5	0.8258
S16	511857	7167375	1	68	10.0028	473.7	475	1.2567
S17	512055.5	7167385	1	430	14.9224	484.9	485.1	0.1752
S18	512314.2	7167540	1	166	9.7191	467.8	468.2	0.4177
S18_02	512314.2	7167540	1	166	12.78	470.3	470.6	0.3201
S19	512426.9	7167475	1	133	8.725	474.8	475.4	0.5964
S20	512450.8	7167394	2	60	4.7244	474.8	475.1	0.353
S21	512419	7167348	1	81	7.7087	478	478.8	0.766
S21_02	512419	7167348	1	81	5.6272	476.6	477.2	0.5849
S22	512374.6	7167293	1	75	6.4088	480.6	480.7	0.136
S22_02	512374.6	7167293	1	75	7.1683	479.8	480.2	0.3475
S23	512234.9	7167231	1	349	13.703	486.6	486.9	0.2317
S24	511896.7	7167182	1	244	13.319	480.3	480.8	0.4787
S25	511618.9	7167155	1	139	8.1347	487.7	487.9	0.2107
S25_02	511618.9	7167155	1	139	6.0763	483.3	483.5	0.2062
S26	511839.6	7167004	1	212	6.5674	479.5	480.4	0.9369
S26_02	511839.6	7167004	1	212	9.5531	479.3	480.6	1.2606
S26_03	511839.6	7167004	1	212	6.5345	479.3	479.6	0.283
S27	512362.2	7166998	1	102	8.8024	481.5	482.1	0.5536
S27_02	512362.2	7166998	1	102	6.3102	482.3	482.6	0.3611
S28	512723.4	7167383	1	198	2.0006	482	482.1	0.0968
S28_02	512723.4	7167383	1	198	2.4086	480.6	480.9	0.2539
S29	513137.5	7167207	3	135	0.5414	NA	NA	NA
S29_02	513137.5	7167207	3	135	1.5348	NA	NA	NA
S30	512594	7167735	3	100	0.7748	NA	NA	NA
S30_02	512594	7167735	3	100	1.6358	NA	NA	NA

SITE_ID	POINT_X	POINT_Y	CLASS	TOT_LENGTH	TOT_HEIGHT	TMIN	TMAX	TROUGH_DEPTH
S31	514796.8	7167008	1	181	5.4938	486.9	487.4	0.5527
S31_02	514796.8	7167008	1	181	4.4836	484	484.3	0.3527
S31_03	514796.8	7167008	1	181	6.3132	487	487.2	0.1478
S32	516219	7168651	1	219	1.5351	467.6	467.6	0.0127
S32_02	516219	7168651	1	219	9.4718	470.7	471	0.2898
S32_03	516219	7168651	1	219	7.0143	471.9	472	0.0733
S33	516294.4	7168943	1	115	2.4767	471.4	472.2	0.8508
S33_02	516294.4	7168943	1	115	4.0961	474.5	475.2	0.7238
S33_03	516294.4	7168943	1	115	5.2013	474.6	475.1	0.5525
S34	516406.9	7168770	1	258	16.2437	464.7	465.1	0.4447
S34_02	516406.9	7168770	1	258	17.1071	464.6	465.2	0.6155
S34_03	516406.9	7168770	1	258	16.3985	464.5	465	0.4686
S35	516081.4	7168888	1	112	4.2775	472.6	473.3	0.653
S35_02	516081.4	7168888	1	112	3.9466	474.7	475.5	0.7702
S35_03	516081.4	7168888	1	112	5.2603	474	475.2	1.2025
S36	516221.7	7168326	1	55	4.7131	464.2	464.6	0.4204
S36_02	516221.7	7168326	1	55	5.011	463.8	464.3	0.4958
S36_03	516221.7	7168326	1	55	5.011	464.3	464.9	0.5298
S37	516200.5	7168183	1	124	1.5768	467.3	467.8	0.4972
S37_02	516200.5	7168183	1	124	2.4516	467.6	468	0.3811
S37_03	516200.5	7168183	1	124	1.3467	466.8	467.3	0.5239
S38	516336.8	7168180	1	120	3.3546	464.4	464.8	0.3818
S38_02	516336.8	7168180	1	120	3.9121	464.8	465	0.1443
S38_03	516336.8	7168180	1	120	4.4068	465.2	465.8	0.589
S39	516063.4	7168156	1	92	0.5069	466.7	467.2	0.4777
S39_02	516063.4	7168156	1	92	0.1001	467.6	468	0.3774
S39_03	516063.4	7168156	1	92	1.3237	467.6	468.3	0.6919
S40	516523.7	7168161	1	68	5.1228	462.4	463	0.5926
S40_02	516523.7	7168161	1	68	3.5395	461.7	462.1	0.4138
S40_03	516523.7	7168161	1	68	4.0728	462.6	462.8	0.2024
S41	516865.1	7168333	2	132	4.8728	462.6	463.6	0.9798
S41_02	516865.1	7168333	2	132	3.6905	462.1	462.7	0.6462
S41_03	516865.1	7168333	2	132	5.4217	460.4	461.1	0.7044
S42	516801.6	7168259	1	94	6.608	463.2	463.6	0.4415
S42_02	516801.6	7168259	1	94	8.6181	464.6	465	0.3927
S42_03	516801.6	7168259	1	94	6.4547	463.2	464.3	1.0293
S43	516994.3	7167873	1	123	1.8544	473.6	473.6	0.006
S43_02	516994.3	7167873	1	123	1.9682	474.1	474.3	0.2384
S43_03	516994.3	7167873	1	123	2.1007	473.4	474.4	1.0212
S44	517051.4	7167992	1	125	5.6748	462.9	463.2	0.3353
S44_02	517051.4	7167992	1	125	6.0037	463.6	464	0.3989
S44_03	517051.4	7167992	1	125	7.794	465	465.6	0.5579
S45	516913.8	7167665	1	159	1.1011	476.1	476.6	0.5072
S45_02	516913.8	7167665	1	159	1.6677	475.7	476.4	0.7203
S45_03	516913.8	7167665	1	159	1.1932	476.9	476.9	0.0168
S46	516882.1	7167810	2	185	3.7306	475.6	476.3	0.6835

SITE_ID	POINT_X	POINT_Y	CLASS	TOT_LENGTH	TOT_HEIGHT	TMIN	TMAX	TROUGH_DEPTH
S46_02	516882.1	7167810	2	185	1.9673	476	476.6	0.6117
S46_03	516882.1	7167810	2	185	2.7653	476.4	476.7	0.3766
S47	516713.5	7167679	2	88	1.3404	475.1	475.9	0.8299
S47_02	516713.5	7167679	2	88	2.8164	475.3	476.1	0.7224
S47_03	516713.5	7167679	2	88	1.4157	474.8	475.8	1.083
S48	516755.8	7167670	1	36	3.2576	475.3	475.7	0.3802
S48_02	516755.8	7167670	1	36	2.5787	476.2	476.6	0.3991
S48_03	516755.8	7167670	1	36	2.5883	475.9	476.8	0.8153
S49	516802.1	7167695	2	59	1.1421	477.1	477.4	0.2607
S49_02	516802.1	7167695	2	59	1.2177	476.5	477.2	0.715
S49_03	516802.1	7167695	2	59	1.4548	476.3	477	0.6504
S50	516681.7	7167535	1	63	2.4934	475.4	476.1	0.7377
S50_02	516681.7	7167535	1	63	3.1158	475.7	476.5	0.7893
S50_03	516681.7	7167535	1	63	2.7281	475.7	476.6	0.8422
S51	548995.3	7187364	1	51	2.5085	466.8	466.9	0.106
S51_02	548995.3	7187364	1	51	1.7048	466.8	467.1	0.3515
S51_03	548995.3	7187364	1	51	0.9868	467	467	0.0578
S52	516612.9	7167545	1	88	6.1216	474.7	475.3	0.629
S52_02	516612.9	7167545	1	88	5.585	474.4	475	0.6015
S52_03	516612.9	7167545	1	88	4.0249	473.1	473.1	0.0266
S52_03	516575.9	7167500	1	70	0.8954	474.8	475.4	0.5477
S53	516575.9	7167500	1	70	2.1162	472.3	472.6	0.328
S53_02	516575.9	7167500	1	70	0.7578	471.9	472.2	0.2825
S54	517045.5	7167499	1	189	6.8831	472.7	472.8	0.1562
S54_02	517045.5	7167499	1	189	8.7972	472.4	472.6	0.2325
S54_03	517045.5	7167499	1	189	8.0301	472.7	472.8	0.1168
S55	517101.1	7167594	1	83	6.141	474.3	475.3	0.945
S55_02	517101.1	7167594	1	83	5.7245	474.6	476	1.3823
S55_03	517101.1	7167594	1	83	5.5919	474.4	475.6	1.2144
S56	516986	7167762	1	135	3.1967	473.4	474.1	0.6074
S56_02	516986	7167762	1	135	4.5179	473.9	474.6	0.6645
S56_03	516986	7167762	1	135	4.2772	473.7	474.5	0.7962
S57	517218.8	7167838	1	176	6.1062	474.4	475.1	0.734
S57_02	517218.8	7167838	1	176	6.1251	476	476.8	0.8398
S57_03	517218.8	7167838	1	176	6.0693	474.7	475.3	0.682
S58	517340.5	7167928	1	145	8.3203	473.2	473.7	0.5517
S58_02	517340.5	7167928	1	145	5.5919	472.7	473.1	0.4195
S58_03	517340.5	7167928	1	145	7.344	473.1	473.8	0.6428
S59	517471.5	7167908	1	198	5.7437	473.5	474	0.5023
S59_02	517471.5	7167908	1	198	3.9536	471.6	472.4	0.7566
S59_03	517471.5	7167908	1	198	7.7782	472.6	473.7	1.0204
S60	517517.8	7167809	1	110	7.6367	472.9	474	1.0803
S60_02	517517.8	7167809	1	110	10.8506	476.3	476.4	0.1918
S60_03	517517.8	7167809	1	110	9.6992	475.5	476.3	0.8293
S61	517470.2	7167738	1	78	10.7784	475.8	476.8	0.9588
S61_02	517470.2	7167738	1	78	7.5571	474.7	475.1	0.3796

SITE_ID	POINT_X	POINT_Y	CLASS	TOT_LENGTH	TOT_HEIGHT	TMIN	TMAX	TROUGH_DEPTH
S61_03	517470.2	7167738	1	78	8.6994	476.1	476.6	0.4608
S62	517450.4	7167670	1	72	8.4835	471.6	472.6	0.9236
S62_02	517450.4	7167670	1	72	7.6616	470.3	470.9	0.6432
S62_03	517450.4	7167670	1	72	10.359	470.9	471.3	0.4515
S63	517390.8	7167633	1	80	9.017	471.6	471.9	0.2923
S63_02	517390.8	7167633	1	80	7.8692	471.1	471.3	0.2215
S63_03	517390.8	7167633	1	80	8.921	471.8	472.1	0.2996
S64	517512.5	7168108	3	119	9.0216	NA	NA	NA
S64_02	517512.5	7168108	3	119	8.9582	NA	NA	NA
S64_03	517512.5	7168108	3	119	9.651	NA	NA	NA
S65	517449	7168047	3	62	2.8895	NA	NA	NA
S65_02	517449	7168047	3	62	3.4282	NA	NA	NA
S65_03	517449	7168047	3	62	2.7116	NA	NA	NA
S66	517377.6	7168068	1	55	5.6867	466.2	467	0.731
S66_02	517377.6	7168068	1	55	5.0458	463.8	464.2	0.3994
S66_03	517377.6	7168068	1	55	6.5993	466.5	466.8	0.3732
S67	517422.6	7168131	1	80	9.0084	459.2	460	0.8373
S67_02	517422.6	7168131	1	80	8.592	459.5	460.1	0.602
S67_03	517422.6	7168131	1	80	10.0109	459.9	460.7	0.8552
S68	516890.8	7166987	1	53	2.9655	470.3	470.5	0.14781
S68_02	516890.8	7166987	1	53	3.9127	471	471.3	0.3346
S68_03	516890.8	7166987	1	53	3.9296	471.1	471.3	0.1836
S69	516959.5	7167054	1	33	2.3947	470.2	470.9	0.673
S69_02	516959.5	7167054	1	33	3.8197	470.2	471.1	0.9024
S69_03	516959.5	7167054	1	33	2.7355	470.2	471	0.814
S70	516935.7	7167033	1	50	2.8829	470.2	470.8	0.5776
S70_02	516935.7	7167033	1	50	2.4556	470.9	471.5	0.6174
S70_03	516935.7	7167033	1	50	3.6175	470.9	471.5	0.6157
S71	517793.2	7167330	1	115	8.4153	475.4	475.7	0.3356
S71_02	517793.2	7167330	1	115	7.9874	475.4	475.8	0.3921
S71_03	517793.2	7167330	1	115	7.242	474.7	475.1	0.4177
S72	518049.3	7167558	1	193	7.7623	480.1	480.8	0.7215
S72_02	518049.3	7167558	1	193	7.2533	479.6	480.5	0.8995
S72_03	518049.3	7167558	1	193	6.2226	478.4	479.3	0.9207
S73	518263.1	7167628	1	94	6.7558	475.3	476.4	1.1609
S73_02	518263.1	7167628	1	94	3.136	474.9	476.8	1.8373
S73_03	518263.1	7167628	1	94	5.6993	475.1	476.6	1.5522
S74	517926.6	7167448	1	174	4.2078	474.5	474.9	0.3923
S74_02	517926.6	7167448	1	174	6.4822	474.5	474.9	0.3707
S74_03	517926.6	7167448	1	174	6.9856	473.8	474.4	0.5708
S75	518197.5	7167383	3	60	2.5761	NA	NA	NA
S75_02	518197.5	7167383	3	60	2.6675	NA	NA	NA
S75_03	518197.5	7167383	3	60	2.5301	NA	NA	NA
S76	518098	7167309	1	60	6.4056	471.8	472.9	1.1103
S76_02	518098	7167309	1	60	5.1808	472.5	473.3	0.7179
S76_03	518098	7167309	1	60	5.4564	471.5	472.5	0.9888

SITE_ID	POINT_X	POINT_Y	CLASS	TOT_LENGTH	TOT_HEIGHT	TMIN	TMAX	TROUGH_DEPTH
S77	548703.2	7186755	3	144	1.6658	NA	NA	NA
S77_02	548703.2	7186755	3	144	0.5805	NA	NA	NA
S77_03	548703.2	7186755	3	144	3.546	NA	NA	NA
S78	517757.2	7167247	1	59	6.3465	472	472.4	0.3522
S78_02	517757.2	7167247	1	59	5.5444	471.6	472	0.4192
S78_03	517757.2	7167247	1	59	6.6067	472.1	472.6	0.4965
S79	518172.1	7167245	1	76	4.4978	472	472.7	0.687
S79_02	518172.1	7167245	1	76	5.7166	473.6	474	0.4624
S79_03	518172.1	7167245	1	76	4.668	472.4	473.3	0.9569
S80	518237.7	7167285	2	65	1.5344	473.1	474.2	1.1188
S80_02	518237.7	7167285	2	65	1.4417	473.8	474.6	0.7738
S80_03	518237.7	7167285	2	65	1.5762	473.6	474.4	0.7804
S81	518644.1	7167450	2	184	4.1728	475.7	476.4	0.654
S81_02	518644.1	7167450	2	184	5.9689	476.8	477.3	0.483
S81_03	518644.1	7167450	2	184	3.4939	476.2	477.3	1.0868
S82	518530.1	7167393	1	64	4.1618	477.2	477.7	0.478
S82_02	518530.1	7167393	1	64	4.4867	478.3	478.6	0.2958
S82_03	518530.1	7167393	1	64	4.4398	477.5	477.9	0.4232
S83	518525.4	7167918	1	57	3.7344	474.7	474.9	0.1972
S83_02	518525.4	7167918	1	57	6.1398	476.4	476.7	0.2812
S83_03	518525.4	7167918	1	57	5.2693	474.9	475.9	1.0331
S84	519090.5	7168623	3	97	0.5333	NA	NA	NA
S84_02	519090.5	7168623	3	97	0.2958	NA	NA	NA
S84_03	519090.5	7168623	3	97	0.9133	NA	NA	NA
S85	518153.9	7168034	3	103	3.3044	NA	NA	NA
S85_02	518153.9	7168034	3	103	15.3351	NA	NA	NA
S85_03	518153.9	7168034	3	103	4.4475	NA	NA	NA
S86	517996.7	7167745	1	50	10.4868	475.1	475.8	0.7295
S86_02	517996.7	7167745	1	50	8.4555	474.2	475.7	1.5082
S86_03	517996.7	7167745	1	50	9.454	474.9	475.7	0.768
S87	517574.5	7167858	1	62	4.4331	469	469.6	0.5827
S87_02	517574.5	7167858	1	62	4.5048	469.6	470.2	0.5342
S87_03	517574.5	7167858	1	62	4.3872	469.5	470.2	0.6516
S88	517641.1	7168015	1	91	5.6864	465.5	466.1	0.6426
S88_02	517641.1	7168015	1	91	4.343	464.3	464.5	0.2181
S88_03	517641.1	7168015	1	91	3.7217	464.7	465.1	0.4464
S89	516958.5	7168226	1	40	9.7085	457.7	457.7	0.0677
S89_02	516958.5	7168226	1	40	8.4633	458.9	459.2	0.2649
S90	519276.3	7168615	3	209	0.3854	NA	NA	NA
S90_02	519276.3	7168615	3	209	0.6952	NA	NA	NA
S90_03	519276.3	7168615	3	209	0.4487	NA	NA	NA
S91	519514.4	7168599	1	111	10.7004	470	470.8	0.8142
S91_02	519514.4	7168599	1	111	7.1466	469.1	470.4	1.2726
S91_03	519514.4	7168599	1	111	6.946	470.3	471	0.7715
S92	518407.1	7168782	3	90	5.5972	NA	NA	NA
S92_02	518407.1	7168782	3	90	4.4608	NA	NA	NA

SITE_ID	POINT_X	POINT_Y	CLASS	TOT_LENGTH	TOT_HEIGHT	TMIN	TMAX	TROUGH_DEPTH
S92_03	518407.1	7168782	3	90	4.1468	NA	NA	NA
S93	533354.9	7162397	1	104	11.8444	485.8	487.1	1.3138
S93_02	533354.9	7162397	1	104	12.0092	487.6	487.8	0.2138
S93_03	533354.9	7162397	1	104	9.317	488.7	490	1.309
S94	533320	7162535	1	126	12.8067	487.4	488.6	1.22
S94_02	533320	7162535	1	126	12.6037	488.5	489.5	0.9817
S94_03	533320	7162535	1	126	11.912	488.1	488.9	0.7912
S95	533338	7162688	1	96	5.3997	476	476.3	0.2771
S95_02	533338	7162688	1	96	6.7656	476.9	477.6	0.7062
S95_03	533338	7162688	1	96	7.7266	479.1	479.4	0.3325
S96	533230	7162778	1	185	9.763	478.3	479.4	1.1798
S96_02	533230	7162778	1	185	8.0612	480.1	480.2	0.0996
S96_03	533230	7162778	1	185	6.617	478.7	479.6	0.9381
S97	532820.4	7162707	2	98	3.0349	480.2	480.9	0.6832
S97_02	532820.4	7162707	2	98	2.622	481.1	481.2	0.1011
S97_03	532820.4	7162707	2	98	5.6275	479.5	480.4	0.8982
S98	533057.5	7162565	1	177	11.5364	487.4	487.7	0.2733
S98_02	533057.5	7162565	1	177	11.6971	479	479	0.0638
S98_03	533057.5	7162565	1	177	10.698	478.6	479.1	0.4338
S99	533844.5	7162226	3	43	1.1025	NA	NA	NA
S99_02	533844.5	7162226	3	43	1.2301	NA	NA	NA
S99_03	533844.5	7162226	3	43	2.0052	NA	NA	NA

SITE_ID	TROUGH_WIDTH	PAR_X	PAR_Y	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	P_FS_LENGTH
S01	NA	16	443	52.8004	445.407	62.8336	442.578	46.8336278
S02	9.95215459	50	458	67.6747	458.357	76.6316	457.194	26.6315904
S03	NA	45	457	69.8865	461.872	97.8412	454.773	52.8411551
S04	5.97223939	30	463	75.6484	464.046	122.404	453.018	92.403907
S05	NA	15	461	43.7913	463.339	81.6111	454.369	66.6111345
S06	10.9245678	1	469	39.7257	460.651	57.6023	456.482	56.6022663
S07	5.97932251	26	459	64.776	458.482	82.714	453.946	56.7139614
S08	9.99615014	20	459	61.9671	458.589	70.9727	457.493	50.972666
S09	5.97314815	30	461	75.6599	461.467	99.5525	458.996	69.5524691
S10	8.99969943	50	461	69.9976	461.351	82.9972	458.846	32.9971807
S100	NA	40	486	106.522	486.529	133.402	483.139	93.401704
S100_02	NA	34	488	94.3017	487.592	116.14	483.878	82.140034
S100_03	NA	41	485	105.383	484.865	133.22	480.611	92.220011
S101	8.97143921	9	486	43.8604	484.265	80.743	480.918	71.7429528
S101_02	4.97796619	30	486	61.7268	483.323	93.5858	481.001	63.5857644
S101_03	5.97469454	24	486	62.7343	483.502	96.5909	480.822	72.5908949
S102	NA	53	429	91.6818	430.992	100.651	429.242	47.650649
S103	NA	116	480	77.655	482.414	65.7118	479.852	50.28821879
S103_02	NA	116	481	97.8933	482.342	71.9216	480.058	44.07842742
S104	5.99763663	28	446	74.9705	448.169	137.946	438.93	109.9456424
S104_02	4.99967705	38	447	78.9949	447.673	141.991	439.885	103.9908282
S104_03	4.97903991	18	447	45.8072	448.469	101.572	439.066	83.5724142
S105	6.99700717	10	447	51.9778	445.796	71.9692	442.242	61.9692165
S105_02	3.99373215	26	447	61.9028	445.146	70.8887	442.652	44.88874557
S106	8.9476632	25	451	66.6104	450.226	92.4592	447.277	67.45918867
S107	3.99730082	16	450	48.9669	445.107	70.9521	442.32	54.95208948
S107_02	4.9633333	15	449	50.604	444.497	65.516	442.384	50.5159996
S107_03	5.99059762	28	450	62.9013	445.329	80.8731	442.303	52.87306774
S108	NA	19	480	39.893	480.8	54.8529	478.754	35.8529359
S108_02	NA	112	483	36.9464	482.087	5.99131	479.543	106.0086924
S109	NA	22	457	55.6651	458.648	89.4618	455.137	67.4617749
S11	4.99542335	45	457	80.9259	454.582	108.9	448.765	63.900229
S11_02	6.97009616	50	456	87.6369	453.209	120.483	447.671	70.4830907
S11_03	3.98627353	30	457	76.7358	454.482	109.623	448.34	79.6225219
S110	4.97889169	37	466	82.6496	462.595	123.477	453.876	86.476514
S110_02	3.99354683	31	464	60.9016	462.315	102.834	454.226	71.833831
S110_03	4.96750369	25	441	61.597	464.326	103.324	456.121	78.324077
S111	NA	23	441	71.9669	442.409	86.9601	440.048	63.9600559
S111_02	NA	23	441	58.8015	441.597	136.539	435.559	113.539004
S111_03	NA	31	441	77.9491	441.284	122.92	435.049	91.919772
S112	10.9670758	54	475	111.665	471.457	124.626	467.579	70.625862
S112_02	9.9788204	44	477	110.765	473.5	121.742	469.935	77.741608
S112_03	8.9923569	41	479	113.903	476.694	154.868	470.126	113.868368
S113	5.995558	70	470	154.885	461.418	168.875	456.283	98.874884
S113_02	8.99525372	75	469	144.924	461.934	170.91	455.192	95.909821
S113_03	5.98571948	80	470	164.607	461.547	181.567	455.15	101.566824

SITE_ID	TROUGH_WIDTH	PAR_X	PAR_Y	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	P_FS_LENGTH
S114	5.99042977	21	457	47.9234	456.752	76.8772	453.345	55.877182
S114_02	1.98932407	25	458	63.6584	456.909	88.5249	453.336	63.5249212
S114_03	11.9560694	17	457	41.8462	457.64	78.7108	453.289	61.7107905
S115	3.99998212	40	460	93.9996	455.763	158.999	445.114	118.999289
S115_02	8.97963307	60	460	120.726	455.12	157.642	446.132	97.642447
S115_03	4.9766567	37	459	103.514	454.976	137.356	445.47	100.355725
S116	6.97533793	33	461	88.6864	459.6	129.542	456.654	96.54199
S116_02	6.99837771	32	463	84.8903	461.318	124.971	457.206	92.97103
S116_03	7.98497034	33	466	87.8347	463.793	120.772	458.582	87.771676
S117	4.97114014	57	460	118.313	458.861	159.076	456.553	102.076484
S117_02	6.98859443	43	462	113.814	459.869	172.718	455.397	129.718119
S117_03	10.9570718	44	462	114.551	459.425	176.309	455.332	132.309246
S118	3.99213362	26	465	63.8761	461.676	108.786	453.9	82.785641
S118_02	3.99336221	41	464	74.8755	461.637	115.808	454.002	74.807504
S118_03	3.96999684	31	465	69.4749	461.806	115.13	453.911	84.129908
S119	3.99293553	28	466	74.8675	463.366	147.739	455.083	119.738615
S119_02	3.9983588	13	466	55.977	463.443	105.957	457.373	92.956508
S119_03	7.96937837	29	465	68.7359	462.626	111.571	457.519	82.571297
S12	16.90447723	3	471	35.7977	471.363	83.528	461.747	80.5279805
S120	3.99840885	29	458	75.9698	454.801	111.955	449.58	82.955448
S120_02	4.97486403	38	458	77.6079	455.267	106.462	450.338	68.46209
S120_03	7.97399195	29	458	68.7757	454.689	94.6912	449.398	65.6911544
S121	5.97112722	23	463	64.6872	460.527	109.471	454.219	86.470666
S121_02	10.9568134	22	460	56.7762	459.306	98.6113	454.102	76.611321
S121_03	7.96078936	36	461	74.6324	459.916	117.422	454.075	81.421643
S122	3.99379591	143	463	85.8666	462.663	69.8915	461.392	73.108515
S122_02	5.99032845	53	466	95.8453	467.121	170.724	464.089	117.724361
S122_03	4.99339419	144	464	100.867	464.731	91.8785	463.616	52.121547
S123	8.96040579	28	462	59.736	461.897	118.476	459.633	90.476477
S123_02	4.99553023	37	465	84.924	464.216	141.873	459.316	104.873059
S123_03	5.97150698	26	463	62.7008	462.728	134.359	459.16	108.358907
S124	8.96277338	54	467	109.545	468.954	133.446	466.845	79.445737
S124_02	5.98969203	164	467	118.796	468.322	16.9708	462.766	147.0292059
S124_03	4.9848612	124	467	76.7671	468.133	10.9667	465.195	113.0332725
S125	6.98280783	33	467	84.7912	464.129	150.629	452.852	117.62914
S125_02	8.97933789	36	465	91.7888	463.328	134.69	456.639	98.690068
S125_03	6.97098712	39	466	96.598	464.047	155.353	453.224	116.353427
S126	6.9982365	38	457	89.9773	454.488	142.964	448.364	104.963974
S126_02	3.98263284	58	457	114.501	454.841	166.275	449.528	108.274921
S126_03	5.96961238	52	457	98.4986	454.727	149.24	446.042	97.24031
S127	3.98631014	27	456	65.7741	455.364	95.6714	453.641	68.6714434
S127_02	3.99876979	41	457	71.9779	456.655	117.964	453.929	76.963709
S127_03	5.98093986	27	458	64.7935	457.679	115.632	453.99	88.631504
S128	7.98146358	154	448	75.8239	448.085	68.8401	447.502	85.1598767
S128_02	6.9698637	36	449	65.7159	449.117	105.544	448.089	69.543691
S129	3.97816924	12	454	44.7544	453.545	58.678	452.275	46.6779963

SITE_ID	TROUGH_WIDTH	PAR_X	PAR_Y	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	P_FS_LENGTH
S129_02	4.9998947	12	455	34.9993	454.19	55.9988	452.27	43.9988207
S13	NA	30	473	49.9712	474.051	71.9585	465.052	41.9584588
S130	NA	48	458	96.8247	458.205	134.756	453.914	86.75607
S130_02	NA	33	458	92.9899	459.445	130.986	453.996	97.985843
S130_03	NA	38	458	86.5354	459.093	123.338	454.035	85.337751
S131	5.97603886	16	452	41.8323	451.398	85.6566	448.805	69.656557
S131_02	4.98728173	12	452	47.8779	450.932	124.682	446.9	112.682043
S131_03	9.95242438	34	451	79.6194	450.077	132.367	447.027	98.367244
S132	6.98232611	29	451	78.8005	450.124	118.7	447.689	89.699544
S132_02	6.97154129	25	450	75.691	449.149	91.626	447.703	66.6259712
S132_03	5.95526242	32	450	65.5079	449.782	98.2618	447.999	66.2618301
S133	3.9735103	7	454	31.7881	453.296	70.5232	451.488	63.5231854
S133_02	3.98608174	1	456	25.9095	455.284	79.7216	451.374	78.7216346
S133_03	1.98669232	2	456	34.7671	454.223	48.674	452.689	46.673962
S134	11.9961113	35	456	56.9815	456.157	77.9747	455.243	42.9747233
S134_02	8.9462558	9	457	55.6656	456.499	104.273	454.99	95.272984
S134_03	6.96304654	21	457	68.6357	456.849	119.367	455.279	98.366512
S135	11.9764413	6	461	56.8881	458.989	100.802	453.318	94.801714
S136	NA	35	489	71.7853	490.27	126.621	486.768	91.621314
S136_02	NA	32	489	61.8907	490.011	122.783	486.657	90.783115
S136_03	NA	35	489	70.8253	489.603	134.668	486.101	99.6679
S137	13.9063558	36	489	104.298	486.316	146.017	482.827	110.016736
S137_02	7.98768254	22	489	82.8722	488.053	123.809	485.521	101.809079
S137_03	5.96773394	35	489	83.5483	486.36	136.263	480.851	101.263258
S138	NA	8	490	66.7608	489.665	155.443	483.757	147.443133
S138_02	NA	7	492	55.7412	491.693	164.237	484.175	157.237351
S139	4.98850824	47	492	112.74	492.183	143.669	490.518	96.669037
S14	8.93720398	7	470	32.7697	467.547	60.5744	460.393	53.5743825
S140	6.99022517	31	485	93.8701	479.14	134.822	467.307	103.822485
S140_02	9.9731573	46	485	108.707	478.938	153.587	469.878	107.586622
S140_03	5.96611197	44	484	110.373	478.09	135.232	469.764	91.231871
S141	NA	37	488	36.7577	487.644	41.7249	486.55	4.7249022
S141_02	NA	21	487	20.947	487.219	42.8914	486.341	21.8913805
S141_03	NA	40	488	39.8476	487.839	59.7714	486.774	19.7713789
S142	NA	40	489	76.8206	489.979	102.76	488.306	62.760023
S142_02	NA	33	489	78.7068	489.659	102.618	487.91	69.617708
S142_03	NA	39	488	70.5959	489.324	104.402	487.546	65.402413
S143	8.94811167	2	486	41.7579	485.717	138.199	480.052	136.198614
S143_02	8.96077058	34	486	88.6126	485.417	170.255	481.101	136.254641
S143_03	6.96203113	26	486	72.604	486.107	154.159	481.39	128.159261
S144	3.99982674	108	460	183.992	459.493	369.984	434.59	261.983973
S144_02	5.99486624	91	460	149.872	459.976	345.704	436.02	254.703953
S144_03	5.98796949	82	459	186.623	453.363	255.487	446.812	173.486698
S145	4.99472202	103	461	168.822	451.289	177.812	446.505	74.812104
S145_02	3.99115304	128	461	189.58	451.57	207.542	445.837	79.54217
S145_03	4.99873689	109	463	180.954	451.347	202.949	445.401	93.94897

SITE_ID	TROUGH_WIDTH	PAR_X	PAR_Y	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	P_FS_LENGTH
S146	9.99451719	34	444	87.9518	443.74	121.933	439.187	87.93311
S146_02	7.98304278	31	445	69.8516	444.316	98.7902	439.408	67.7901544
S146_03	9.96361706	34	445	83.6944	444.123	125.542	439.244	91.541575
S147	2.99355854	77	455	124.732	452.489	151.674	450.064	74.673633
S147_02	3.99693848	73	456	139.893	452.106	158.878	450.54	85.878304
S147_03	2.99075297	101	454	151.531	452.276	166.485	450.256	65.485249
S148	8.93193245	9	466	50.6143	464.156	92.2966	459.862	83.2966353
S148_02	8.94890683	14	465	47.7275	464.254	88.4947	460.072	74.4947453
S148_03	9.99271884	24	465	60.9556	463.854	108.921	458.659	84.920635
S149	5.96480436	10	469	20.8186	469.363	58.6539	467.334	48.6539096
S149_02	3.98952321	5	468	24.9345	468.789	51.8638	467.478	46.8638018
S149_03	4.98591637	8	467	23.9324	469.265	52.8507	467.036	44.8507135
S15	8.96104387	43	471	46.7966	472.222	56.7533	470.537	13.7532778
S150	4.99367757	47	458	107.863	456.147	155.803	452.975	108.80274
S150_02	6.96078	29	457	63.6414	456.52	110.378	453.82	81.378083
S150_03	6.97996664	43	458	94.7281	456.567	128.631	454.089	85.630814
S151	5.99937629	35	459	97.9898	452.782	111.988	449.56	76.988357
S151_02	3.97609254	39	459	83.4979	453.727	105.366	449.398	66.366452
S151_03	4.97532928	35	458	92.5411	451.912	103.487	448.833	68.486849
S152	7.95583067	31	480	84.5307	475.804	129.282	469.601	98.282248
S152_02	8.92991772	18	480	52.5873	477.051	106.467	467.124	88.4668
S16	10.9905445	10	477	33.9708	474.918	62.9458	466.997	52.9458456
S17	3.99307087	20	487	50.9117	485.024	87.8476	472.078	67.8475591
S18	4.98321314	32	475	88.7046	468.138	104.647	465.281	72.647476
S18_02	3.98852124	43	478	103.702	470.544	121.65	465.22	78.649898
S19	8.97760338	28	478	78.8034	475.699	94.7636	469.275	66.7635912
S20	4.96746641	21	478	46.6942	475.428	69.5445	473.276	48.5445297
S21	6.98580948	36	482	80.8358	478.747	112.771	474.291	76.770924
S21_02	6.98089918	38	480	75.7926	477.026	101.722	474.373	63.721674
S22	4.99260625	32	483	64.9039	480.651	89.8669	476.591	57.8669123
S22_02	7.98663926	25	482	51.9132	480.126	85.8564	474.832	60.8563721
S23	4.97081566	32	490	71.5797	486.574	111.346	476.297	79.346271
S24	12.9165072	32	486	87.4348	480.841	121.216	472.681	89.216452
S25	5.97275256	53	491	107.51	487.789	148.323	482.865	95.323355
S25_02	3.99177498	50	485	114.764	483.39	143.704	478.924	93.703899
S26	10.9615936	87	483	130.543	480.341	159.441	476.433	72.441362
S26_02	10.9870192	79	486	153.818	480.448	176.791	476.447	97.791128
S26_03	3.97585185	23	483	79.517	479.454	101.384	476.466	78.384222
S27	5.99331553	45	487	110.876	481.863	139.844	478.198	94.844029
S27_02	5.98212622	35	485	67.7974	482.628	99.7021	478.69	64.7021037
S28	4.99890026	33	483	73.9837	482.122	98.9782	480.999	65.9782251
S28_02	2.9957624	24	482	71.8983	480.778	82.8828	479.591	58.8827596
S29	NA	20	469	65.9655	470.381	92.9514	469.541	72.9514153
S29_02	NA	16	468	56.8101	471.816	103.654	469.535	87.653534
S30	NA	123	467	72.94	471.202	52.9564	466.225	70.0436
S30_02	NA	124	468	70.7319	470.481	47.8188	466.364	76.18123

SITE_ID	TROUGH_WIDTH	PAR_X	PAR_Y	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	P_FS_LENGTH
S31	10.959311	35	489	89.6679	487.348	140.478	483.506	105.478442
S31_02	10.993626	39	485	120.93	484.314	170.901	480.516	131.900913
S31_03	5.96891403	46	490	104.456	487.183	136.29	483.687	90.290204
S32	1.99016404	37	467	94.5328	467.644	107.469	465.465	70.468858
S32_02	4.98175386	51	474	112.588	470.821	160.412	464.528	109.412474
S32_03	7.97683697	50	473	92.7307	472.53	114.667	465.986	64.667031
S33	13.9860294	66	472	165.834	472.973	176.823	469.523	110.823371
S33_02	8.98403035	42	476	113.798	475.777	128.771	471.904	86.771102
S33_03	9.95596311	68	475	138.388	475.589	171.243	469.799	103.242565
S34	4.99349278	49	470	112.853	464.989	155.797	453.756	106.796975
S34_02	4.98226181	54	471	120.571	464.951	164.415	453.893	110.41464
S34_03	6.97686568	61	472	145.517	464.98	185.385	455.602	124.385288
S35	5.99030858	41	474	80.8692	473.172	119.806	469.723	78.806172
S35_02	11.9338861	34	477	80.5537	475.534	102.433	473.053	68.432522
S35_03	13.9761684	37	476	69.8808	475.133	110.811	470.74	73.811049
S36	8.98764463	30	466	75.8957	464.75	104.856	461.287	74.855854
S36_02	7.95963647	33	466	74.6216	464.821	91.4239	460.989	58.4239429
S36_03	10.9311236	25	466	61.6118	465.15	91.4239	460.989	66.4239429
S37	10.9067805	29	467	56.517	468.054	76.3475	465.423	47.3474634
S37_02	5.99804612	28	468	55.9818	468.382	71.9766	465.548	43.9765535
S37_03	10.9581894	26	467	53.7947	467.249	69.7339	465.653	43.7339327
S38	9.93007035	27	465	65.5315	464.761	98.3077	461.645	71.3076965
S38_02	4.96643205	26	466	69.53	465.507	103.302	462.088	77.301787
S38_03	11.9245896	29	467	74.5287	465.86	109.309	462.593	80.308738
S39	11.9503503	23	467	51.7849	469.017	62.7393	466.493	39.7393392
S39_02	6.97716546	44	467	64.788	470.203	75.7521	467.1	31.7520821
S39_03	6.96755964	24	468	53.7497	469.366	79.6293	466.676	55.629253
S40	5.98037862	26	465	74.7547	462.836	89.7057	459.877	63.7056792
S40_02	6.99591285	24	463	70.9585	462.071	92.9457	459.461	68.9456993
S40_03	5.94526398	20	464	46.5439	462.351	62.4253	459.927	42.4252718
S41	10.9788384	20	463	53.8961	463.488	75.8538	458.127	55.8537928
S41_02	12.9176368	21	462	57.6825	462.805	72.5375	458.31	51.5374992
S41_03	7.93938866	19	461	50.6136	460.983	108.174	455.578	89.174171
S42	9.96695528	30	464	80.7323	463.527	122.594	457.392	92.59355
S42_02	7.96201577	34	465	70.6629	464.947	150.283	456.382	116.283048
S42_03	10.9833999	35	464	77.8823	464.316	108.836	457.545	73.835508
S43	7.9971769	118	472	73.9739	473.751	46.9834	470.146	71.0165857
S43_02	8.95917637	106	473	61.7188	474.247	38.8231	471.032	67.1769024
S43_03	12.9483944	146	473	89.6427	474.522	49.8015	470.899	96.1984832
S44	10.978211	35	463	63.8732	463.519	131.739	457.325	96.7385316
S44_02	5.99278663	40	464	104.874	464.376	160.506	457.996	120.5064411
S44_03	13.9382539	40	466	98.5634	465.665	169.25	458.206	129.2502257
S45	7.97577773	60	477	35.891	476.7	28.9122	475.899	31.08780572
S45_02	9.97840443	64	477	63.8618	476.867	93.797	475.332	29.79700165
S45_03	7.94021627	62	477	65.5068	477.028	90.302	475.807	28.30199601
S46	10.9426467	71	477	72.6194	477.054	95.4995	473.269	24.49946216

SITE_ID	TROUGH_WIDTH	PAR_X	PAR_Y	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	P_FS_LENGTH
S46_02	7.95595918	40	476	74.5871	477.585	95.4715	474.033	55.47151015
S46_03	5.97412154	47	477	89.6118	477.616	105.542	474.235	58.542138
S47	11.9891699	28	476	67.9386	475.945	97.9116	474.66	69.91155433
S47_02	8.98042586	29	477	62.863	476.168	113.752	474.184	84.7520608
S47_03	11.9331973	33	476	63.6437	475.81	90.4934	474.584	57.49341313
S48	5.97795133	23	477	55.7942	475.985	80.7023	473.742	57.70234303
S48_02	6.97769135	26	477	60.8056	476.674	84.7291	474.421	58.72910931
S48_03	9.99647112	31	477	58.9795	476.603	74.9735	474.412	43.97353339
S49	8.94581351	25	477	44.7291	477.367	53.6749	475.858	28.67488108
S49_02	8.94068479	36	477	62.5848	477.204	81.4596	475.782	45.45957254
S49_03	11.9372649	22	477	70.9288	477.042	99.4772	475.545	77.47720766
S50	8.94710069	14	476	48.712	476.457	69.5886	473.507	55.58856096
S50_02	10.9129279	16	476	54.5646	477.174	86.3113	472.884	70.31133853
S50_03	9.92743361	28	476	52.6154	476.995	73.463	473.272	45.4630087
S51	4.95386046	51	467	51.5201	467.248	100.068	464.492	49.067981
S51_02	6.96309183	19	467	44.7627	467.481	84.5518	465.295	65.5518293
S51_03	2.99803041	68	466	49.9672	467.053	6.9954	465.013	61.00459572
S52	8.95273149	20	476	49.7374	475.363	87.5378	469.878	67.53781899
S52_02	6.99963083	9	476	36.998	475.028	83.9956	470.415	74.99556994
S52_03	2.9788927	7	476	36.695	475.352	51.5714	471.975	44.57137443
S52_03	8.92581481	13	473	43.6905	473.086	49.6483	472.105	36.6482713
S53	6.98681772	12	473	46.9115	472.554	76.855	470.884	64.8549949
S53_02	5.96824958	12	472	47.746	472.159	64.656	471.242	52.6560371
S54	3.99672884	56	474	87.928	472.925	111.908	467.117	55.9084075
S54_02	4.98101506	36	475	87.6659	472.599	117.552	466.203	81.551955
S54_03	4.97622003	33	475	81.61	472.848	115.448	466.97	82.4483047
S55	8.95654252	58	476	91.5558	475.296	131.363	469.859	73.3626237
S55_02	13.9307476	43	476	89.5548	475.95	129.357	470.276	86.3569418
S55_03	15.9868049	51	476	92.9233	475.54	141.883	470.408	90.8828939
S56	5.97940004	9	475	41.8558	474.139	64.7768	471.803	55.7768337
S56_02	7.93658699	17	476	59.5244	474.675	75.3976	471.482	58.3975764
S56_03	9.93996197	18	476	57.6518	474.527	75.5437	471.723	57.5437109
S57	5.98281064	67	476	104.699	475.115	130.625	469.894	63.6246989
S57_02	7.96781106	76	476	98.6047	476.916	143.421	469.875	67.4205992
S57_03	5.98908177	78	476	113.793	475.322	137.749	469.931	59.7488806
S58	6.97035798	57	475	88.6231	473.862	143.39	466.68	86.3902213
S58_02	6.97331154	81	474	102.607	473.161	125.52	468.408	44.5196077
S58_03	6.97480558	67	475	94.6581	476.849	123.554	467.656	56.5536989
S59	8.9727765	45	475	122.628	473.897	145.558	469.256	100.5583727
S59_02	6.98319147	55	473	117.717	472.307	113.678	469.046	58.6782368
S59_03	5.9770829	60	476	135.481	473.67	186.286	468.222	126.2857504
S60	12.9347573	27	474	49.7491	473.857	119.398	466.363	92.3977599
S60_02	5.96737636	34	477	67.6303	476.518	135.261	466.149	101.2605307
S60_03	11.967349	18	476	45.8748	476.622	117.679	466.301	99.6789317
S61	11.9794636	35	477	65.887	476.739	146.748	466.222	111.7484287
S61_02	4.99650071	52	476	79.944	475.052	117.917	468.443	65.9174169

SITE_ID	TROUGH_WIDTH	PAR_X	PAR_Y	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	P_FS_LENGTH
S61_03	7.98023179	39	477	65.8369	476.595	112.721	468.301	73.7207741
S62	8.9561974	20	475	48.7615	472.558	72.6447	466.517	52.64471224
S62_02	4.96982176	34	474	64.6078	470.995	85.4809	466.338	51.48093425
S62_03	5.97995166	23	476	68.7694	471.497	101.659	465.641	78.6591782
S63	4.99443748	22	475	55.9377	472.029	77.9132	465.983	55.9132247
S63_02	6.96880573	30	474	60.7282	471.207	82.6301	466.131	52.63012511
S63_03	6.97823732	27	475	57.8197	472.232	87.7264	466.079	60.72641202
S64	NA	17	466	75.9475	464.349	133.89	456.978	116.889887
S64_02	NA	19	466	69.9254	465.138	133.857	457.042	114.857277
S64_03	NA	17	466	72.9935	463.713	134.988	456.349	117.987958
S65	NA	18	469	62.983	467.938	96.9739	466.111	78.973869
S65_02	NA	18	468	68.9682	467.817	118.945	464.572	100.945045
S65_03	NA	21	469	63.7248	468.396	102.557	466.288	81.557062
S66	12.8905527	19	467	51.5622	467.045	99.1581	461.313	80.15809778
S66_02	5.95633034	26	465	54.5997	464.222	94.3086	459.954	68.30856372
S66_03	7.94742853	20	467	38.7437	467.01	79.4743	460.401	59.47428526
S67	6.99119144	12	462	39.9497	459.882	57.927	452.992	45.92701479
S67_02	6.99870116	22	462	42.992	460.193	63.9881	453.408	41.98812491
S67_03	6.98913002	11	463	35.9441	460.789	61.9037	452.989	50.90372305
S68	4.99570636	45	471	75.9347	470.547	104.91	468.035	59.9098335
S68_02	5.99374869	60	472	84.9114	471.256	108.886	468.087	48.8864346
S68_03	5.99409758	48	472	77.9233	471.393	111.89	468.07	63.8898216
S69	11.9861465	76	471	101.882	470.982	115.866	468.605	39.8660824
S69_02	8.93367155	29	472	70.4767	471.086	89.3367	468.18	60.33671556
S69_03	11.9973895	55	471	88.9806	471.287	111.976	468.265	56.9756352
S70	5.97725738	48	471	80.693	470.942	97.6285	468.117	49.62853727
S70_02	11.9285705	65	471	88.4702	471.573	120.28	468.544	55.2797528
S70_03	8.93696168	50	472	78.4467	471.418	101.279	468.383	51.2785614
S71	11.971742	80	477	115.727	475.735	171.595	468.585	91.5950426
S71_02	6.99419051	107	477	137.885	475.779	187.844	469.013	80.8439738
S71_03	10.9861579	70	476	100.873	475.126	147.814	468.758	77.8137613
S72	9.99024666	76	481	101.901	480.922	126.876	473.238	50.8761326
S72_02	15.9521621	75	480	111.665	480.49	158.525	472.747	83.5246114
S72_03	9.97379292	86	479	115.696	479.477	157.586	472.777	71.5859282
S73	8.96482742	52	480	118.535	476.387	156.386	473.244	104.3864338
S73_02	11.9497955	73	477	108.544	476.25	128.46	473.864	55.4603018
S73_03	12.9492808	48	479	119.532	476.635	153.399	473.301	105.3991721
S74	5.99387937	53	474	55.9429	474.848	99.898	469.792	46.8979895
S74_02	5.99436177	71	476	85.9192	475.025	141.867	469.518	70.8665619
S74_03	7.97443211	52	477	90.7092	474.387	129.585	470.014	77.5845128
S75	NA	70	475	70.7441	474.66	166.398	472.424	96.3981453
S75_02	NA	90	475	98.8706	475.008	184.758	472.333	94.7581631
S75_03	NA	73	475	72.9455	474.972	154.884	472.47	81.8843252
S76	7.98808493	22	475	65.9017	472.851	107.839	468.594	85.8391466
S76_02	7.96622221	26	475	78.6664	473.372	120.489	469.819	94.489111
S76_03	8.95489749	42	474	86.564	472.502	132.333	468.544	90.3334851

SITE_ID	TROUGH_WIDTH	PAR_X	PAR_Y	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	P_FS_LENGTH
S77	NA	47	463	83.7936	464.679	98.7675	461.334	51.767513
S77_02	NA	34	462	69.4463	463.424	83.3356	461.42	49.3355889
S77_03	NA	38	464	74.7031	465.132	103.588	460.454	65.588278
S78	6.99846366	45	475	87.9807	472.351	122.973	468.654	77.9730043
S78_02	9.97545102	24	474	76.811	472.052	111.725	468.456	87.7250515
S78_03	6.988389981	30	475	69.8839	472.652	109.818	468.393	79.8175569
S79	8.99131145	20	474	55.9459	472.668	107.896	469.502	87.8957375
S79_02	6.9945495	25	475	55.9564	474.123	119.907	469.283	94.906563
S79_03	8.98575448	26	474	55.9114	476.676	109.826	469.332	83.8258881
S80	8.94958656	19	475	64.6359	474.212	76.5687	473.466	57.56868499
S80_02	8.98954644	16	475	53.9373	474.639	79.9071	473.558	63.90707944
S80_03	7.9825438	24	475	65.856	474.444	87.808	473.424	63.80798184
S81	14.9168086	28	475	71.6007	476.849	117.346	470.827	89.3455609
S81_02	6.97381557	34	478	74.7195	477.534	116.562	472.031	82.5623459
S81_03	13.94254874	43	475	80.6676	477.451	127.475	471.506	84.4747313
S82	4.99460084	41	479	86.9061	477.978	100.891	474.838	59.890937
S82_02	4.97854046	48	480	77.6652	478.628	94.5923	475.513	46.59226879
S82_03	5.998339811	40	479	81.9773	478.115	102.972	474.56	62.9715001
S83	2.99030866	20	475	43.8986	474.977	70.8364	471.266	50.83638278
S83_02	6.99249671	25	477	57.9378	476.706	77.9164	470.86	52.91639191
S83_03	10.95758293	27	477	46.8188	475.846	55.7802	471.731	28.78020244
S84	NA	101	482	67.7573	485.219	55.8001	481.467	45.19989555
S84_02	NA	120	482	80.6328	486.129	64.7053	481.704	55.29465337
S84_03	NA	112	482	76.9255	485.798	60.941	481.087	51.05903265
S85	NA	26	465	75.7037	468.713	107.579	461.696	81.5789656
S85_02	NA	46	465	103.564	468.978	136.426	480.335	90.4256549
S85_03	NA	50	465	111.826	469.856	139.782	460.553	89.782214
S86	9.98351549	53	478	107.822	476.097	142.764	467.513	89.7642716
S86_02	12.9694998	61	477	105.749	475.711	124.804	468.545	63.8038438
S86_03	8.96956704	34	477	79.7295	475.688	117.601	467.546	83.6009901
S87	11.9931997	16	470	35.9796	469.587	57.9671	465.567	41.96713195
S87_02	6.95302166	25	470	43.7047	470.188	71.5168	465.495	46.5167942
S87_03	7.97582648	23	470	40.8761	470.259	67.7945	465.613	44.79452512
S88	11.9996903	16	466	56.9985	466.214	113.997	460.314	97.9970575
S88_02	4.98273447	24	466	68.7617	464.535	82.7134	461.657	58.71339217
S88_03	6.96450944	37	466	84.569	465.11	98.4981	462.278	61.49806207
S89	2.98397436	26	460	47.7436	457.751	96.4818	450.292	70.4818378
S89_02	3.9792235	17	460	39.7922	459.055	80.5793	451.537	63.57927587
S90	NA	34	482	68.7062	484.04	78.6636	481.615	44.6635677
S90_02	NA	32	481	70.8652	484.373	79.8481	481.695	47.8480618
S90_03	NA	29	482	77.8004	484.416	86.5543	481.551	57.5542996
S91	10.9925276	32	472	81.9443	470.997	145.901	461.3	113.900821
S91_02	11.9283411	43	472	93.4387	470.55	121.271	464.853	78.271468
S91_03	10.9791654	28	472	72.8617	471.716	99.8106	465.054	71.8105943
S92	NA	52	469	112.845	471.47	156.802	463.403	104.80171
S92_02	NA	48	468	123.794	470.151	149.751	463.539	101.750683

SITE_ID	TROUGH_WIDTH	PAR_X	PAR_Y	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	P_FS_LENGTH
S92_03	NA	53	468	100.901	472.294	129.872	463.853	76.872494
S93	10.9817937	47	492	117.805	486.295	134.777	480.156	87.776559
S93_02	5.98818527	49	492	114.774	487.923	142.718	479.991	93.718416
S93_03	8.9712191	51	492	107.655	489.484	124.6	482.683	73.600265
S94	12.9861973	41	491	102.891	488.488	158.831	478.193	117.831182
S94_02	9.96905879	49	491	118.632	489.496	174.459	478.396	125.458529
S94_03	7.99724747	47	491	100.965	488.849	144.95	479.088	97.95011
S95	5.97673573	46	478	101.605	476.259	124.5	472.6	78.499818
S95_02	5.97782835	30	480	82.6933	477.511	115.571	473.234	85.571348
S95_03	8.99265849	54	482	102.916	479.666	142.883	474.273	88.883352
S96	13.9589288	49	483	113.666	479.501	178.475	473.237	129.474875
S96_02	4.9821931	40	483	110.605	480.196	162.419	474.939	122.419495
S96_03	10.9937084	45	480	102.941	480.123	166.904	473.383	121.904482
S97	10.9616957	46	480	122.572	481.123	137.523	476.965	91.522937
S97_02	3.99889746	78	479	160.956	481.304	178.951	476.378	100.950662
S97_03	7.99655118	90	480	153.934	480.201	170.926	474.373	80.926282
S98	7.97024804	24	490	57.7843	487.658	103.613	478.464	79.613224
S98_02	2.99728637	42	489	102.907	479.196	117.893	477.303	75.893264
S98_03	5.98924663	26	488	78.8584	479.014	107.806	477.302	81.806439
S99	NA	28	491	67.7016	492.383	73.6753	489.898	45.6752605
S99_02	NA	39	491	93.9498	492.169	113.939	489.77	74.939171
S99_03	NA	35	491	88.5847	492.425	116.454	488.995	81.454077

SITE_ID	HS_SLOPE	HS_DEGREES	ASPECT	VEG_PARENT	VEG_TROUGH	VEG_RIDGE	VEG_HS	VEG_FS
S01	0.281972	15.74696417	E	Y	N	N	Y	N
S02	0.1298323	7.397463	E	Y	N	N	N	N
S03	0.253933	14.24813627	N/A	N	N	Y	N	N
S04	0.2358651	13.27151414	E	Y	Y	Y	N	Y
S05	0.237188	13.34329357	N/A	N	N	N	N	N
S06	0.2332551	13.12977108	SW	Y	N	Y	N	N
S07	0.252877	14.19128333	W	Y	Y	N	N	Y
S08	0.1217029	6.938939529	SW	Y	Y	N	N	Y
S09	0.1034002	5.903418443	S	Y	Y	N	N	Y
S10	0.1927066	10.90756388	SE	Y	Y	N	N	Y
S100	0.1261224	7.188325961	NE	Y	Y	Y	N	N
S100_02	0.1700636	9.651588279	NE	Y	Y	Y	N	N
S100_03	0.1528145	8.688410941	NE	Y	Y	Y	N	N
S101	0.0907366	5.184626428	S	Y	Y	Y	N	N
S101_02	0.0728868	4.168735472	S	Y	Y	Y	N	N
S101_03	0.0791485	4.525442086	S	Y	Y	Y	N	N
S102	0.1951862	11.04448844	NE	Y	N	N	N	N
S103	0.2144562	12.10409765	N/A	N	Y	N	N	Y
S103_02	0.0879612	5.026867472	N/A	N	Y	N	N	Y
S104	0.146707	8.346153477	NE	Y	Y	N	N	Y
S104_02	0.1236191	7.047100398	NE	Y	Y	N	N	Y
S104_03	0.1686122	9.570745016	NE	Y	Y	N	N	Y
S105	0.177776	10.08049969	N	Y	Y	Y	N	N
S105_02	0.2775349	15.51119046	N	Y	Y	Y	N	N
S106	0.1140788	6.50809747	N	Y	Y	Y	N	N
S107	0.1267492	7.223673009	NE	Y	Y	Y	N	N
S107_02	0.1417047	8.065380635	NE	Y	Y	Y	N	N
S107_03	0.168375	9.557528707	NE	Y	Y	Y	N	N
S108	0.1367791	7.788532555	S	Y	Y	Y	N	N
S108_02	0.0821836	4.698213653	S	Y	Y	Y	N	N
S109	0.1038919	5.931288108	NE	Y	Y	N	Y	Y
S11	0.2079439	11.74690301	E	Y	Y	Y	Y	N
S11_02	0.1685887	9.56943736	E	Y	Y	Y	Y	N
S11_03	0.186756	10.57847092	E	Y	Y	Y	Y	N
S110	0.2135552	12.05473412	SE	Y	Y	Y	Y	N
S110_02	0.1929112	10.91886979	SE	Y	Y	Y	Y	N
S110_03	0.1966327	11.12430285	SE	Y	Y	Y	Y	N
S111	0.157499	8.950501612	NW	Y	Y	N	N	Y
S111_02	0.077669	4.441192236	NW	Y	Y	N	N	Y
S111_03	0.1386304	7.892633401	NW	Y	Y	N	N	Y
S112	0.2992495	16.65978732	NE	Y	Y	N	Y	Y
S112_02	0.3248243	17.99505815	NE	Y	Y	N	Y	Y
S112_03	0.1603264	9.108510537	NE	Y	Y	N	Y	Y
S113	0.3670717	20.15675911	NE	Y	Y	Y	Y	N
S113_02	0.2594253	14.54336729	NE	Y	Y	Y	Y	N
S113_03	0.3771683	20.66488502	NE	Y	Y	Y	Y	N

SITE_ID	HS_SLOPE	HS_DEGREES	ASPECT	VEG_PARENT	VEG_TROUGH	VEG_RIDGE	VEG_HS	VEG_FS
S114	0.1176739	6.711353764	E	Y	Y	Y	Y	N
S114_02	0.1437071	8.17782183	E	Y	Y	Y	Y	N
S114_03	0.1180104	6.730369677	E	Y	Y	Y	Y	N
S115	0.1638238	9.303768069	SE	Y	Y	Y	Y	N
S115_02	0.2434726	13.68371357	SE	Y	Y	Y	Y	N
S115_03	0.2808997	15.69003436	SE	Y	Y	Y	Y	N
S116	0.0720955	4.123631313	SE	Y	Y	Y	Y	Y
S116_02	0.1025929	5.857648848	SE	Y	Y	Y	Y	Y
S116_03	0.1582263	8.991160759	SE	Y	Y	Y	Y	Y
S117	0.0566023	3.239617104	NW	Y	Y	Y	Y	Y
S117_02	0.075922	4.341681512	NW	Y	Y	Y	Y	Y
S117_03	0.0662748	3.791719617	NW	Y	Y	Y	Y	Y
S118	0.1731369	9.822639669	SE	Y	Y	Y	Y	N
S118_02	0.1865461	10.56685063	SE	Y	Y	Y	Y	N
S118_03	0.172921	9.810624183	SE	Y	Y	Y	Y	N
S119	0.1136692	6.484933677	SE	Y	Y	Y	Y	Y
S119_02	0.1214478	6.924536344	SE	Y	Y	Y	Y	Y
S119_03	0.1192261	6.799059382	SE	Y	Y	Y	Y	Y
S12	0.2014675	11.3907583	NE	Y	Y	Y	Y	Y
S120	0.145091	8.255496392	S	Y	Y	Y	Y	N
S120_02	0.1708243	9.693940625	S	Y	Y	Y	Y	N
S120_03	0.2041444	11.53807556	S	Y	Y	Y	Y	N
S121	0.1408735	8.018687797	W	Y	Y	Y	Y	N
S121_02	0.124374	7.089699003	W	Y	Y	Y	Y	N
S121_03	0.1364946	7.772531824	W	Y	Y	Y	Y	N
S122	0.0795925	4.550719846	N	Y	Y	Y	Y	N
S122_02	0.0404999	2.319208704	N	Y	Y	Y	Y	N
S122_03	0.1240973	7.07408436	N	Y	Y	Y	Y	N
S123	0.0385441	2.207324186	N/A	Y	Y	Y	Y	N
S123_02	0.0860313	4.917122699	N/A	Y	Y	Y	Y	N
S123_03	0.0497934	2.850597615	N/A	Y	Y	Y	Y	N
S124	0.0882525	5.04343145	W	Y	Y	Y	Y	N
S124_02	0.0545663	3.123320899	W	Y	Y	Y	Y	N
S124_03	0.0446593	2.557091847	W	Y	Y	Y	Y	N
S125	0.1712874	9.71971816	N	Y	Y	Y	Y	Y
S125_02	0.1559324	8.862895269	N	Y	Y	Y	Y	Y
S125_03	0.1842093	10.43740489	N	Y	Y	Y	Y	Y
S126	0.1155669	6.592248591	N/A	Y	Y	Y	Y	N
S126_02	0.1026148	5.858885948	N/A	Y	Y	Y	Y	N
S126_03	0.1711452	9.711806029	N/A	Y	Y	Y	Y	N
S127	0.0576406	3.298913215	SE	Y	Y	Y	Y	N
S127_02	0.0592704	3.39197564	SE	Y	Y	Y	Y	N
S127_03	0.0725756	4.151000473	SE	Y	Y	Y	Y	N
S128	0.0834935	4.772752761	W	Y	Y	Y	Y	N
S128_02	0.0258036	1.478108188	W	Y	Y	Y	Y	N
S129	0.0911977	5.210830643	N	Y	Y	Y	Y	N

SITE_ID	HS_SLOPE	HS_DEGREES	ASPECT	VEG_PARENT	VEG_TROUGH	VEG_RIDGE	VEG_HS	VEG_FS
S129_02	0.0913972	5.22216292	N	Y	Y	Y	Y	N
S13	0.4092634	22.25748943	E	Y	Y	Y	Y	Y
S130	0.1131307	6.454470815	N	Y	Y	Y	Y	N
S130_02	0.143426	8.162042462	N	Y	Y	Y	Y	N
S130_03	0.1374367	7.825517759	N	Y	Y	Y	Y	N
S131	0.0591704	3.386265332	SE	Y	Y	Y	Y	N
S131_02	0.0525063	3.005628489	SE	Y	Y	Y	Y	N
S131_03	0.0578128	3.308745517	SE	Y	Y	Y	Y	N
S132	0.0610216	3.491948446	S	Y	Y	Y	Y	N
S132_02	0.0907502	5.185399494	S	Y	Y	Y	Y	N
S132_03	0.0544331	3.115714386	S	Y	Y	Y	Y	N
S133	0.0466708	2.672103491	NW	Y	Y	Y	Y	N
S133_02	0.0726732	4.156562831	NW	Y	Y	Y	Y	N
S133_03	0.1102982	6.294178813	NW	Y	Y	Y	Y	N
S134	0.0435236	2.492147367	W	Y	Y	Y	Y	N
S134_02	0.0310549	1.778745736	W	Y	Y	Y	Y	N
S134_03	0.0309437	1.772380517	W	Y	Y	Y	Y	N
S135	0.1291353	7.358188749	N/A	Y	Y	Y	Y	N
S136	0.0638559	3.653710506	NW	Y	Y	Y	Y	Y
S136_02	0.0550922	3.153364292	NW	Y	Y	Y	Y	Y
S136_03	0.0548568	3.139917316	NW	Y	Y	Y	Y	Y
S137	0.0836284	4.780432367	SE	Y	Y	Y	Y	Y
S137_02	0.0618489	3.539171987	SE	Y	Y	Y	Y	Y
S137_03	0.104513	5.966491715	SE	Y	Y	Y	Y	Y
S138	0.0666187	3.811338978	W	Y	Y	Y	Y	Y
S138_02	0.0692854	3.963426005	W	Y	Y	Y	Y	Y
S139	0.0538302	3.081267804	SW	Y	Y	N	Y	N
S14	0.2573024	14.4293485	NW	Y	Y	Y	Y	Y
S140	0.2889627	16.11731918	NW	Y	Y	N	N	Y
S140_02	0.2018797	11.41345052	NW	Y	Y	N	N	Y
S140_03	0.3349558	18.51857477	NW	Y	Y	N	N	Y
S141	0.2203634	12.4272755	SE	Y	Y	Y	Y	Y
S141_02	0.0399965	2.290409091	SE	Y	Y	Y	Y	Y
S141_03	0.0534487	3.059471355	SE	Y	Y	Y	Y	Y
S142	0.0644964	3.690261597	SE	Y	Y	Y	Y	N
S142_02	0.0731549	4.184011207	SE	Y	Y	Y	Y	N
S142_03	0.0525905	3.010439458	SE	Y	Y	Y	Y	N
S143	0.0587418	3.361791785	SE	Y	Y	N	Y	Y
S143_02	0.0528539	3.025491738	SE	Y	Y	N	Y	Y
S143_03	0.0578344	3.309981755	SE	Y	Y	N	Y	Y
S144	0.1338913	7.626050873	SE	N	Y	N	N	N
S144_02	0.1223286	6.974264627	SE	N	Y	N	N	N
S144_03	0.0951315	5.434277185	SE	N	Y	N	N	N
S145	0.5321395	28.01920582	E	Y	Y	N	Y	N
S145_02	0.3191778	17.70193066	E	Y	Y	N	Y	N
S145_03	0.2703743	15.12956124	E	Y	Y	N	Y	N

SITE_ID	HS_SLOPE	HS_DEGREES	ASPECT	VEG_PARENT	VEG_TROUGH	VEG_RIDGE	VEG_HS	VEG_FS
S146	0.1339941	7.631835358	N	Y	Y	N	Y	Y
S146_02	0.1695767	9.624470757	N	Y	Y	N	Y	Y
S146_03	0.1165741	6.649194273	N	Y	Y	N	Y	Y
S147	0.0900118	5.143434485	E	N	Y	N	Y	N
S147_02	0.0824789	4.715021635	E	N	Y	N	Y	N
S147_03	0.1351365	7.696130538	E	N	Y	N	Y	N
S148	0.1030364	5.882792024	E	Y	Y	Y	Y	Y
S148_02	0.1025897	5.857466125	E	Y	Y	Y	Y	Y
S148_03	0.1083039	6.181260968	E	Y	Y	Y	Y	Y
S149	0.0536324	3.069967905	N	Y	Y	Y	Y	Y
S149_02	0.0486719	2.786496953	N	Y	Y	Y	Y	Y
S149_03	0.0770861	4.407990604	N	Y	Y	Y	Y	Y
S15	0.1692426	9.605860887	SW	Y	Y	Y	Y	Y
S150	0.0661566	3.78497688	NW	Y	Y	Y	Y	N
S150_02	0.0577619	3.305841467	NW	Y	Y	Y	Y	N
S150_03	0.0731092	4.181411174	NW	Y	Y	Y	Y	N
S151	0.2301739	12.96222909	E	Y	Y	Y	N	N
S151_02	0.197965	11.19777806	E	Y	Y	Y	N	N
S151_03	0.2813153	15.71210617	E	Y	Y	Y	N	N
S152	0.1385986	7.890842267	NE	Y	Y	Y	Y	N
S152_02	0.1842389	10.43904658	NE	Y	Y	Y	Y	N
S16	0.2733488	15.28825696	NW	Y	Y	Y	N	N
S17	0.3504963	19.31537741	N	Y	N	N	N	N
S18	0.179208	10.16001467	N	Y	Y	Y	N	N
S18_02	0.2966346	16.52217748	N	Y	Y	Y	N	N
S19	0.4024891	21.92424772	E	Y	Y	N	N	Y
S20	0.0941736	5.379884901	E	Y	Y	Y	N	N
S21	0.1395203	7.942654429	SE	Y	Y	Y	N	N
S21_02	0.1023177	5.842039752	SE	Y	Y	Y	N	N
S22	0.1626325	9.237282085	SE	Y	N	N	N	N
S22_02	0.155984	8.865783157	SE	Y	N	N	N	N
S23	0.2584385	14.49038043	SE	Y	Y	Y	N	N
S24	0.2415484	13.57958938	W	Y	Y	Y	N	N
S25	0.1206454	6.879226722	NW	Y	Y	Y	Y	Y
S25_02	0.1543242	8.772918734	NW	Y	Y	Y	Y	Y
S26	0.1352377	7.701822637	S	Y	Y	Y	N	N
S26_02	0.1741533	9.879169879	S	Y	Y	Y	N	N
S26_03	0.1366568	7.781656987	S	Y	Y	Y	N	N
S27	0.1265444	7.212127529	NW	Y	Y	Y	N	N
S27_02	0.1234333	7.036616675	NW	Y	Y	Y	N	N
S28	0.0449219	2.572104941	NW	Y	Y	Y	Y	N
S28_02	0.1080617	6.167548625	NW	Y	Y	Y	Y	N
S29	0.0311051	1.781618726	N/A	Y	Y	Y	Y	N
S29_02	0.0487069	2.788498568	N/A	Y	Y	Y	Y	N
S30	0.2490498	13.98499442	N/A	Y	Y	Y	N	Y
S30_02	0.1796653	10.18539814	N/A	Y	Y	Y	N	Y

SITE_ID	HS_SLOPE	HS_DEGREES	ASPECT	VEG_PARENT	VEG_TROUGH	VEG_RIDGE	VEG_HS	VEG_FS
S31	0.0756064	4.32369941	NE	Y	Y	Y	Y	Y
S31_02	0.07599	4.345556577	NE	Y	Y	Y	Y	Y
S31_03	0.1098378	6.268117176	NE	Y	Y	Y	Y	Y
S32	0.1684747	9.563086061	S	Y	Y	N	Y	N
S32_02	0.1315718	7.495455226	S	Y	Y	N	Y	N
S32_03	0.2983092	16.61032503	S	Y	Y	N	Y	N
S33	0.3139406	17.42918837	NE	Y	Y	N	N	N
S33_02	0.2586523	14.5018636	NE	Y	Y	N	N	N
S33_03	0.1762306	9.994644867	NE	Y	Y	N	N	N
S34	0.261559	14.65785299	E	Y	Y	N	N	N
S34_02	0.2522061	14.15514644	E	Y	Y	N	N	N
S34_03	0.2352475	13.23798735	E	Y	Y	N	N	N
S35	0.088597	5.063011719	NW	Y	Y	Y	N	N
S35_02	0.1133838	6.468785832	NW	Y	Y	Y	N	N
S35_03	0.1073339	6.126326804	NW	Y	Y	Y	N	N
S36	0.1195849	6.819324022	N	Y	Y	Y	N	N
S36_02	0.2280514	12.84668336	N	Y	Y	Y	N	N
S36_03	0.1395572	7.944724282	N	Y	Y	Y	N	N
S37	0.1326794	7.557826615	S	Y	Y	Y	Y	Y
S37_02	0.1771327	10.04476512	S	Y	Y	Y	Y	Y
S37_03	0.1000804	5.715154177	S	Y	Y	Y	Y	Y
S38	0.0950415	5.429166229	SE	Y	Y	Y	N	Y
S38_02	0.1012355	5.780674596	SE	Y	Y	Y	N	Y
S38_03	0.0939274	5.365900673	SE	Y	Y	Y	N	Y
S39	0.2304352	12.97644664	SE	Y	Y	Y	Y	Y
S39_02	0.2829959	15.80129453	SE	Y	Y	Y	Y	Y
S39_03	0.1039162	5.932665947	SE	Y	Y	Y	Y	Y
S40	0.1978738	11.1927457	NW	Y	Y	N	Y	Y
S40_02	0.1187375	6.771454289	NW	Y	Y	N	Y	Y
S40_03	0.1525935	8.676039531	NW	Y	Y	N	Y	Y
S41	0.2441424	13.71993723	NW	Y	Y	N	N	N
S41_02	0.3026261	16.83718396	NW	Y	Y	N	N	N
S41_03	0.0938994	5.364307546	NW	Y	Y	N	N	N
S42	0.1465653	8.338204416	NW	Y	Y	Y	Y	Y
S42_02	0.1075707	6.13974059	NW	Y	Y	Y	Y	Y
S42_03	0.218743	12.33870509	NW	Y	Y	Y	Y	Y
S43	0.1335879	7.608972726	SE	Y	Y	N	N	Y
S43_02	0.1404195	7.993185138	SE	Y	Y	N	N	Y
S43_03	0.0909335	5.195814583	SE	Y	Y	N	N	Y
S44	0.091269	5.214881789	N/A	Y	Y	Y	Y	N
S44_02	0.1146826	6.542247618	N/A	Y	Y	Y	Y	N
S44_03	0.1055246	6.023818905	N/A	Y	Y	Y	Y	N
S45	0.1147761	6.547534179	W	Y	Y	Y	Y	N
S45_02	0.051254	2.934071543	W	Y	Y	Y	Y	N
S45_03	0.0492393	2.818929979	W	Y	Y	Y	Y	N
S46	0.1654015	9.391779516	W	Y	Y	N	Y	N

SITE_ID	HS_SLOPE	HS_DEGREES	ASPECT	VEG_PARENT	VEG_TROUGH	VEG_RIDGE	VEG_HS	VEG_FS
S46_02	0.1700983	9.65351995	W	Y	Y	N	Y	N
S46_03	0.2122369	11.98247304	W	Y	Y	N	Y	N
S47	0.042882	2.455455254	SW	Y	Y	Y	Y	N
S47_02	0.0389868	2.232645696	SW	Y	Y	Y	Y	N
S47_03	0.045643	2.613336255	SW	Y	Y	Y	Y	N
S48	0.0900349	5.144745725	SE	Y	Y	Y	Y	N
S48_02	0.0941626	5.379257927	SE	Y	Y	Y	Y	N
S48_03	0.1370014	7.801035225	SE	Y	Y	Y	Y	N
S49	0.1686487	9.572780594	SE	Y	Y	Y	Y	N
S49_02	0.0753333	4.308144564	SE	Y	Y	Y	Y	N
S49_03	0.0524338	3.001485625	SE	Y	Y	Y	Y	N
S50	0.141302	8.042760052	NE	Y	Y	N	Y	N
S50_02	0.1351322	7.695884246	NE	Y	Y	N	Y	N
S50_03	0.178596	10.12603636	NE	Y	Y	N	Y	N
S51	0.0567873	3.250181527	NW	Y	Y	Y	Y	Y
S51_02	0.0549271	3.143932305	NW	Y	Y	Y	Y	Y
S51_03	0.0474684	2.717697491	NW	Y	Y	Y	Y	Y
S52	0.1450883	8.255343774	W	Y	Y	N	N	Y
S52_02	0.0981562	5.605980454	W	Y	Y	N	N	Y
S52_03	0.2269708	12.78781711	W	Y	Y	N	N	Y
S52_03	0.1647926	9.357815267	NW	Y	Y	Y	N	Y
S53	0.0557851	3.192938756	NW	Y	Y	Y	N	Y
S53_02	0.0541927	3.101976144	NW	Y	Y	Y	N	Y
S54	0.2422147	13.61565741	SE	Y	Y	Y	N	Y
S54_02	0.2140293	12.0807119	SE	Y	Y	Y	N	Y
S54_03	0.1737174	9.854924746	SE	Y	Y	Y	N	Y
S55	0.136572	7.776883433	E	Y	Y	Y	Y	Y
S55_02	0.1425577	8.113286635	E	Y	Y	Y	Y	Y
S55_03	0.104813	5.983493506	E	Y	Y	Y	Y	Y
S56	0.101902	5.81847238	E	Y	Y	Y	Y	N
S56_02	0.2011633	11.37400653	E	Y	Y	Y	Y	N
S56_03	0.1567355	8.907808702	E	Y	Y	Y	Y	N
S57	0.2013808	11.38598236	NW	Y	Y	Y	Y	N
S57_02	0.1571026	8.928338773	NW	Y	Y	Y	Y	N
S57_03	0.2250387	12.68249242	NW	Y	Y	Y	Y	N
S58	0.1311481	7.471589741	N	Y	Y	Y	N	N
S58_02	0.2074344	11.71891476	N	Y	Y	Y	N	N
S58_03	0.318152	17.64857228	N	Y	Y	Y	N	N
S59	0.2023905	11.4415672	NE	Y	Y	Y	N	N
S59_02	0.8073456	38.91551833	NE	Y	Y	Y	N	N
S59_03	0.1072449	6.121284792	NE	Y	Y	Y	N	N
S60	0.1075914	6.140909956	SE	Y	Y	N	N	N
S60_02	0.153316	8.716485188	SE	Y	Y	N	N	N
S60_03	0.1437369	8.179496172	SE	Y	Y	N	N	N
S61	0.130072	7.410967922	SE	Y	Y	N	N	N
S61_02	0.1740376	9.872733331	SE	Y	Y	N	N	N

SITE_ID	HS_SLOPE	HS_DEGREES	ASPECT	VEG_PARENT	VEG_TROUGH	VEG_RIDGE	VEG_HS	VEG_FS
S61_03	0.1769116	10.03248411	SE	Y	Y	N	N	N
S62	0.2529771	14.19667002	SE	Y	Y	N	Y	Y
S62_02	0.2231005	12.57675151	SE	Y	Y	N	Y	Y
S62_03	0.1780434	10.09534994	SE	Y	Y	N	Y	Y
S63	0.2751334	15.38335473	S	Y	Y	N	Y	Y
S63_02	0.2317464	13.04776078	S	Y	Y	N	Y	Y
S63_03	0.2057363	11.62560536	S	Y	Y	N	Y	Y
S64	0.1272109	7.249711403	SE	Y	Y	N	N	Y
S64_02	0.1266396	7.217492874	SE	Y	Y	N	N	Y
S64_03	0.1187783	6.773760983	SE	Y	Y	N	N	Y
S65	0.0537557	3.077010746	SE	Y	Y	N	N	Y
S65_02	0.0649321	3.715117749	SE	Y	Y	N	N	Y
S65_03	0.0542796	3.106941709	SE	Y	Y	N	N	Y
S66	0.1204138	6.866142788	NW	Y	Y	Y	N	Y
S66_02	0.1074722	6.134159416	NW	Y	Y	Y	N	Y
S66_03	0.1622688	9.216978538	NW	Y	Y	Y	N	Y
S67	0.3832545	20.96955501	N	Y	Y	Y	N	Y
S67_02	0.3231409	17.90776715	N	Y	Y	Y	N	Y
S67_03	0.3004743	16.72417174	N	Y	Y	Y	N	Y
S68	0.0867262	4.956642949	NW	Y	Y	Y	N	N
S68_02	0.1321836	7.5299068	NW	Y	Y	Y	N	N
S68_03	0.0978286	5.587386045	NW	Y	Y	Y	N	N
S69	0.1699247	9.643854496	N	Y	Y	Y	N	N
S69_02	0.1540723	8.758821058	N	Y	Y	Y	N	N
S69_03	0.1314286	7.487389324	N	Y	Y	Y	N	N
S70	0.1668028	9.469913536	NW	Y	Y	Y	N	N
S70_02	0.0952011	5.438228857	NW	Y	Y	Y	N	N
S70_03	0.1329412	7.572567368	NW	Y	Y	Y	N	N
S71	0.1279781	7.292961631	S	Y	Y	Y	N	N
S71_02	0.1354404	7.713228052	S	Y	Y	Y	N	N
S71_03	0.1356601	7.72558695	S	Y	Y	Y	N	N
S72	0.3076521	17.10062258	S	Y	Y	N	N	Y
S72_02	0.1652473	9.383175954	S	Y	Y	N	N	Y
S72_03	0.159943	9.087091056	S	Y	Y	N	N	Y
S73	0.0830271	4.746216775	SE	Y	Y	Y	Y	N
S73_02	0.1198213	6.832679617	SE	Y	Y	Y	Y	N
S73_03	0.0984547	5.62291766	SE	Y	Y	Y	Y	N
S74	0.1150196	6.561305009	SE	Y	Y	Y	Y	N
S74_02	0.0984354	5.621819632	SE	Y	Y	Y	Y	N
S74_03	0.1124646	6.416783198	SE	Y	Y	Y	Y	N
S75	0.023377	1.339157069	NE	Y	Y	Y	Y	Y
S75_02	0.0311512	1.784254534	NE	Y	Y	Y	Y	Y
S75_03	0.0305338	1.748912356	NE	Y	Y	Y	Y	Y
S76	0.1015083	5.796145456	W	Y	Y	Y	N	Y
S76_02	0.084942	4.855162292	W	Y	Y	Y	N	Y
S76_03	0.0864747	4.942338294	W	Y	Y	Y	N	Y

SITE_ID	HS_SLOPE	HS_DEGREES	ASPECT	VEG_PARENT	VEG_TROUGH	VEG_RIDGE	VEG_HS	VEG_FS
S77	0.2233419	12.58992488	S	Y	Y	N	Y	N
S77_02	0.1442913	8.210613565	S	Y	Y	N	Y	N
S77_03	0.161948	9.199071526	S	Y	Y	N	Y	N
S78	0.1056689	6.031997881	SE	Y	Y	N	N	N
S78_02	0.1030014	5.880808622	SE	Y	Y	N	N	N
S78_03	0.1066369	6.086839854	SE	Y	Y	N	N	N
S79	0.0609338	3.486939683	S	Y	Y	N	N	Y
S79_02	0.0756745	4.327583978	S	Y	Y	N	N	Y
S79_03	0.1362063	7.756317543	S	Y	Y	N	N	Y
S80	0.0625169	3.577296303	E	Y	Y	Y	Y	Y
S80_02	0.0416099	2.382695375	E	Y	Y	Y	Y	Y
S80_03	0.0464924	2.661898981	E	Y	Y	Y	Y	Y
S81	0.1316278	7.498611656	E	Y	Y	Y	N	Y
S81_02	0.1315038	7.491625938	E	Y	Y	Y	N	Y
S81_03	0.127017	7.238774449	E	Y	Y	Y	N	Y
S82	0.2245282	12.6546495	W	Y	Y	Y	N	Y
S82_02	0.1839779	10.42458104	W	Y	Y	Y	N	Y
S82_03	0.169304	9.609282472	W	Y	Y	Y	N	Y
S83	0.1377805	7.844847683	NW	N	Y	Y	N	N
S83_02	0.2926187	16.31046056	NW	N	Y	Y	N	N
S83_03	0.4592343	24.66620879	NW	N	Y	Y	N	N
S84	0.31377	17.42029362	N/A	N	Y	Y	N	N
S84_02	0.2778093	15.52579012	N/A	N	Y	Y	N	N
S84_03	0.2947102	16.4207833	N/A	N	Y	Y	N	N
S85	0.220152	12.41572545	N/A	N	N	N	Y	N
S85_02	0.3456065	19.06548031	N/A	N	N	N	Y	N
S85_03	0.3327748	18.40614306	N/A	N	N	N	Y	N
S86	0.2456592	13.80192819	NW	Y	Y	Y	Y	N
S86_02	0.3761116	20.61186103	NW	Y	Y	Y	Y	N
S86_03	0.2149901	12.13333988	NW	Y	Y	Y	Y	N
S87	0.1828491	10.36201171	E	Y	Y	N	N	N
S87_02	0.1687468	9.578243407	E	Y	Y	N	N	N
S87_03	0.1725882	9.792109633	E	Y	Y	N	N	N
S88	0.1035255	5.910517667	E	Y	Y	Y	N	N
S88_02	0.2063124	11.65727095	E	Y	Y	Y	N	N
S88_03	0.2032735	11.49016074	E	Y	Y	Y	N	N
S89	0.1530584	8.702067664	E	Y	Y	Y	N	Y
S89_02	0.1843183	10.44345022	E	Y	Y	Y	N	Y
S90	0.2436074	13.69100655	N/A	N	Y	Y	N	N
S90_02	0.2980884	16.59870629	N/A	N	Y	Y	N	N
S90_03	0.3272373	18.12002475	N/A	N	Y	Y	N	N
S91	0.1516296	8.622056421	SE	N	N	Y	Y	N
S91_02	0.2046542	11.56611375	SE	N	N	Y	Y	N
S91_03	0.2472164	13.88603802	SE	N	N	Y	Y	N
S92	0.1835177	10.3990797	N/A	N	N	N	N	N
S92_02	0.2547311	14.29108392	N/A	N	N	N	N	N

SITE_ID	HS_SLOPE	HS_DEGREES	ASPECT	VEG_PARENT	VEG_TROUGH	VEG_RIDGE	VEG_HS	VEG_FS
S92_03	0.2913409	16.24300295	N/A	N	N	N	N	N
S93	0.3617458	19.88737736	E	Y	Y	Y	N	N
S93_02	0.2838661	15.84744718	E	Y	Y	Y	N	N
S93_03	0.4013246	21.86680372	E	Y	Y	Y	N	N
S94	0.1840293	10.42743351	NE	Y	Y	N	Y	N
S94_02	0.1988152	11.24464225	NE	Y	Y	N	Y	N
S94_03	0.2219082	12.51165946	NE	Y	Y	N	Y	N
S95	0.1598188	9.080151028	E	Y	Y	Y	N	Y
S95_02	0.1300807	7.411458129	E	Y	Y	Y	N	Y
S95_03	0.1349326	7.684653313	E	Y	Y	Y	N	Y
S96	0.0966451	5.520210037	NE	Y	Y	Y	N	Y
S96_02	0.1014517	5.792933611	NE	Y	Y	Y	N	Y
S96_03	0.1053728	6.015217368	NE	Y	Y	Y	N	Y
S97	0.2781105	15.54180984	N/A	Y	Y	N	Y	N
S97_02	0.2737254	15.30833671	N/A	Y	Y	N	Y	N
S97_03	0.3429773	18.93080223	N/A	Y	Y	N	Y	N
S98	0.20062	11.34408661	SW	Y	Y	N	N	N
S98_02	0.1263276	7.199899752	SW	Y	Y	N	N	N
S98_03	0.0591508	3.385149162	SW	Y	Y	N	N	N
S99	0.4160089	22.58774685	NW	Y	Y	N	N	N
S99_02	0.120004	6.843001305	NW	Y	Y	N	N	N
S99_03	0.1230886	7.017161745	NW	Y	Y	N	N	N

SITE_ID	WATER	WATER_FS	WATER_P	WATER_TR
S01	N	N	N	N
S02	N	N	N	N
S03	Y	Y	N	N
S04	Y	Y	N	N
S05	Y	Y	N	N
S06	Y	N	N	Y
S07	Y	N	Y	N
S08	Y	N	Y	N
S09	Y	N	Y	N
S10	N	N	N	N
S100	N	N	N	N
S100_02	N	N	N	N
S100_03	N	N	N	N
S101	N	N	N	N
S101_02	N	N	N	N
S101_03	N	N	N	N
S102	N	N	N	N
S103	N	N	N	N
S103_02	N	N	N	N
S104	N	N	N	N
S104_02	N	N	N	N
S104_03	N	N	N	N
S105	N	N	N	N
S105_02	N	N	N	N
S106	N	N	N	N
S107	N	N	N	N
S107_02	N	N	N	N
S107_03	N	N	N	N
S108	N	N	N	N
S108_02	N	N	N	N
S109	Y	N	Y	N
S11	N	N	N	N
S11_02	N	N	N	N
S11_03	N	N	N	N
S110	N	N	N	N
S110_02	N	N	N	N
S110_03	N	N	N	N
S111	N	N	N	N
S111_02	N	N	N	N
S111_03	N	N	N	N
S112	N	N	N	N
S112_02	N	N	N	N
S112_03	N	N	N	N
S113	Y	Y	N	N
S113_02	Y	Y	N	N
S113_03	Y	Y	N	N

SITE_ID	WATER	WATER_FS	WATER_P	WATER_TR
S114	N	N	N	N
S114_02	N	N	N	N
S114_03	N	N	N	N
S115	Y	Y	N	N
S115_02	Y	Y	N	N
S115_03	Y	Y	N	N
S116	N	N	N	N
S116_02	N	N	N	N
S116_03	N	N	N	N
S117	N	N	N	N
S117_02	N	N	N	N
S117_03	N	N	N	N
S118	N	N	N	N
S118_02	N	N	N	N
S118_03	N	N	N	N
S119	N	N	N	N
S119_02	N	N	N	N
S119_03	N	N	N	N
S12	Y	N	Y	N
S120	N	N	N	N
S120_02	N	N	N	N
S120_03	N	N	N	N
S121	N	N	N	N
S121_02	N	N	N	N
S121_03	N	N	N	N
S122	N	N	N	N
S122_02	N	N	N	N
S122_03	N	N	N	N
S123	N	N	N	N
S123_02	N	N	N	N
S123_03	N	N	N	N
S124	N	N	N	N
S124_02	N	N	N	N
S124_03	N	N	N	N
S125	N	N	N	N
S125_02	N	N	N	N
S125_03	N	N	N	N
S126	N	N	N	N
S126_02	N	N	N	N
S126_03	N	N	N	N
S127	N	N	N	N
S127_02	N	N	N	N
S127_03	N	N	N	N
S128	N	N	N	N
S128_02	N	N	N	N
S129	N	N	N	N

SITE_ID	WATER	WATER_FS	WATER_P	WATER_TR
S129_02	N	N	N	N
S13	N	N	N	N
S130	N	N	N	N
S130_02	N	N	N	N
S130_03	N	N	N	N
S131	N	N	N	N
S131_02	N	N	N	N
S131_03	N	N	N	N
S132	N	N	N	N
S132_02	N	N	N	N
S132_03	N	N	N	N
S133	N	N	N	N
S133_02	N	N	N	N
S133_03	N	N	N	N
S134	N	N	N	N
S134_02	N	N	N	N
S134_03	N	N	N	N
S135	N	N	N	N
S136	N	N	N	N
S136_02	N	N	N	N
S136_03	N	N	N	N
S137	N	N	N	N
S137_02	N	N	N	N
S137_03	N	N	N	N
S138	N	N	N	N
S138_02	N	N	N	N
S139	N	N	N	N
S14	N	N	N	N
S140	N	N	N	N
S140_02	N	N	N	N
S140_03	N	N	N	N
S141	Y	Y	N	N
S141_02	Y	Y	N	N
S141_03	Y	Y	N	N
S142	N	N	N	N
S142_02	N	N	N	N
S142_03	N	N	N	N
S143	N	N	N	N
S143_02	N	N	N	N
S143_03	N	N	N	N
S144	N	N	N	N
S144_02	N	N	N	N
S144_03	N	N	N	N
S145	Y	Y	N	N
S145_02	Y	Y	N	N
S145_03	Y	Y	N	N

SITE_ID	WATER	WATER_FS	WATER_P	WATER_TR
S146	N	N	N	N
S146_02	N	N	N	N
S146_03	N	N	N	N
S147	N	N	N	N
S147_02	N	N	N	N
S147_03	N	N	N	N
S148	N	N	N	N
S148_02	N	N	N	N
S148_03	N	N	N	N
S149	N	N	N	N
S149_02	N	N	N	N
S149_03	N	N	N	N
S15	N	N	N	N
S150	N	N	N	N
S150_02	N	N	N	N
S150_03	N	N	N	N
S151	N	N	N	N
S151_02	N	N	N	N
S151_03	N	N	N	N
S152	N	N	N	N
S152_02	N	N	N	N
S16	N	N	N	N
S17	N	N	N	N
S18	Y	Y	N	N
S18_02	Y	Y	N	N
S19	N	N	N	N
S20	N	N	N	N
S21	N	N	N	N
S21_02	N	N	N	N
S22	N	N	N	N
S22_02	N	N	N	N
S23	Y	Y	N	N
S24	N	N	N	N
S25	N	N	N	N
S25_02	N	N	N	N
S26	N	N	N	N
S26_02	N	N	N	N
S26_03	N	N	N	N
S27	N	N	N	N
S27_02	N	N	N	N
S28	N	N	N	N
S28_02	N	N	N	N
S29	N	N	N	N
S29_02	N	N	N	N
S30	N	N	N	N
S30_02	N	N	N	N

SITE_ID	WATER	WATER_FS	WATER_P	WATER_TR
S31	N	N	N	N
S31_02	N	N	N	N
S31_03	N	N	N	N
S32	N	N	N	N
S32_02	N	N	N	N
S32_03	N	N	N	N
S33	N	N	N	N
S33_02	N	N	N	N
S33_03	N	N	N	N
S34	N	N	N	N
S34_02	N	N	N	N
S34_03	N	N	N	N
S35	N	N	N	N
S35_02	N	N	N	N
S35_03	N	N	N	N
S36	N	N	N	N
S36_02	N	N	N	N
S36_03	N	N	N	N
S37	N	N	N	N
S37_02	N	N	N	N
S37_03	N	N	N	N
S38	N	N	N	N
S38_02	N	N	N	N
S38_03	N	N	N	N
S39	Y	N	Y	N
S39_02	Y	N	Y	N
S39_03	Y	N	Y	N
S40	N	N	N	N
S40_02	N	N	N	N
S40_03	N	N	N	N
S41	N	N	N	N
S41_02	N	N	N	N
S41_03	N	N	N	N
S42	N	N	N	N
S42_02	N	N	N	N
S42_03	N	N	N	N
S43	N	N	N	N
S43_02	N	N	N	N
S43_03	N	N	N	N
S44	N	N	N	N
S44_02	N	N	N	N
S44_03	N	N	N	N
S45	N	N	N	N
S45_02	N	N	N	N
S45_03	N	N	N	N
S46	N	N	N	N

SITE_ID	WATER	WATER_FS	WATER_P	WATER_TR
S46_02	N	N	N	N
S46_03	N	N	N	N
S47	N	N	N	N
S47_02	N	N	N	N
S47_03	N	N	N	N
S48	N	N	N	N
S48_02	N	N	N	N
S48_03	N	N	N	N
S49	N	N	N	N
S49_02	N	N	N	N
S49_03	N	N	N	N
S50	N	N	N	N
S50_02	N	N	N	N
S50_03	N	N	N	N
S51	N	N	N	N
S51_02	N	N	N	N
S51_03	N	N	N	N
S52	N	N	N	N
S52_02	N	N	N	N
S52_03	N	N	N	N
S52_03	N	N	N	N
S53	N	N	N	N
S53_02	N	N	N	N
S54	N	N	N	N
S54_02	N	N	N	N
S54_03	N	N	N	N
S55	N	N	N	N
S55_02	N	N	N	N
S55_03	N	N	N	N
S56	N	N	N	N
S56_02	N	N	N	N
S56_03	N	N	N	N
S57	N	N	N	N
S57_02	N	N	N	N
S57_03	N	N	N	N
S58	N	N	N	N
S58_02	N	N	N	N
S58_03	N	N	N	N
S59	N	N	N	N
S59_02	N	N	N	N
S59_03	N	N	N	N
S60	N	N	N	N
S60_02	N	N	N	N
S60_03	N	N	N	N
S61	N	N	N	N
S61_02	N	N	N	N

SITE_ID	WATER	WATER_FS	WATER_P	WATER_TR
S61_03	N	N	N	N
S62	N	N	N	N
S62_02	N	N	N	N
S62_03	N	N	N	N
S63	N	N	N	N
S63_02	N	N	N	N
S63_03	N	N	N	N
S64	N	N	N	N
S64_02	N	N	N	N
S64_03	N	N	N	N
S65	N	N	N	N
S65_02	N	N	N	N
S65_03	N	N	N	N
S66	N	N	N	N
S66_02	N	N	N	N
S66_03	N	N	N	N
S67	Y	Y	N	N
S67_02	Y	Y	N	N
S67_03	Y	Y	N	N
S68	N	N	N	N
S68_02	N	N	N	N
S68_03	N	N	N	N
S69	N	N	N	N
S69_02	N	N	N	N
S69_03	N	N	N	N
S70	N	N	N	N
S70_02	N	N	N	N
S70_03	N	N	N	N
S71	N	N	N	N
S71_02	N	N	N	N
S71_03	N	N	N	N
S72	N	N	N	N
S72_02	N	N	N	N
S72_03	N	N	N	N
S73	N	N	N	N
S73_02	N	N	N	N
S73_03	N	N	N	N
S74	N	N	N	N
S74_02	N	N	N	N
S74_03	N	N	N	N
S75	Y	Y	Y	N
S75_02	Y	Y	Y	N
S75_03	Y	Y	Y	N
S76	N	N	N	N
S76_02	N	N	N	N
S76_03	N	N	N	N

SITE_ID	WATER	WATER_FS	WATER_P	WATER_TR
S77	N	N	N	N
S77_02	N	N	N	N
S77_03	N	N	N	N
S78	N	N	N	N
S78_02	N	N	N	N
S78_03	N	N	N	N
S79	N	N	N	N
S79_02	N	N	N	N
S79_03	N	N	N	N
S80	N	N	N	N
S80_02	N	N	N	N
S80_03	N	N	N	N
S81	N	N	N	N
S81_02	N	N	N	N
S81_03	N	N	N	N
S82	N	N	N	N
S82_02	N	N	N	N
S82_03	N	N	N	N
S83	N	N	N	N
S83_02	N	N	N	N
S83_03	N	N	N	N
S84	N	N	N	N
S84_02	N	N	N	N
S84_03	N	N	N	N
S85	N	N	N	N
S85_02	N	N	N	N
S85_03	N	N	N	N
S86	N	N	N	N
S86_02	N	N	N	N
S86_03	N	N	N	N
S87	N	N	N	N
S87_02	N	N	N	N
S87_03	N	N	N	N
S88	N	N	N	N
S88_02	N	N	N	N
S88_03	N	N	N	N
S89	N	N	N	N
S89_02	N	N	N	N
S90	N	N	N	N
S90_02	N	N	N	N
S90_03	N	N	N	N
S91	N	N	N	N
S91_02	N	N	N	N
S91_03	N	N	N	N
S92	N	N	N	N
S92_02	N	N	N	N

SITE_ID	WATER	WATER_FS	WATER_P	WATER_TR
S92_03	N	N	N	N
S93	N	N	N	N
S93_02	N	N	N	N
S93_03	N	N	N	N
S94	N	N	N	N
S94_02	N	N	N	N
S94_03	N	N	N	N
S95	N	N	N	N
S95_02	N	N	N	N
S95_03	N	N	N	N
S96	N	N	N	N
S96_02	N	N	N	N
S96_03	N	N	N	N
S97	N	N	N	N
S97_02	N	N	N	N
S97_03	N	N	N	N
S98	Y	Y	N	N
S98_02	Y	Y	N	N
S98_03	Y	Y	N	N
S99	N	N	N	N
S99_02	N	N	N	N
S99_03	N	N	N	N

Variable Label	Label Definition
SITE_ID	Unique Identifier for each feature
POINT_X	The Longitude (X) value of the site coordinates measured in decimal degrees
POINT_Y	The Latitude (Y) value of the site coordinates measured in decimal degrees
CLASS	1- pioneer slump, 2-succeeding slump, 3- remnant slump
RMAX_X	The X value associated with the highest point of the ridge, measured in metres
RMAX_Y	The Y value associated with the highest point of the ridge, measured in metres
RMIN_X	The X value associated with the lowest point of the hillslope, where the foot slope starts, measured in metres
RMIN_Y	The Y value associated with the lowest point of the hillslope, where the foot slope starts, measure in metres
HS_DEGREES	The calculated hillslope of the feature displayed in degrees
DIST_W	The calculated distance from the ridge of the feature to the nearest water body, measured in metres
SLOPE_W	The calculated slope from the ridge of the feature to the nearest water body, presented in degrees

SITE_ID	POINT_X	POINT_Y	Class	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	DEGREE_HS	DIST_W	SLOPE_W
S01	511883	7169257	3.00	52.80	445.41	62.83	442.58	15.75	126.51	1.28
S02	511600	7168211	2.00	67.67	458.36	76.63	457.19	7.40	123.70	0.54
S03	511624	7167857	3.00	69.89	461.87	97.84	454.77	14.25	59.16	6.84
S04	511819	7167946	2.00	75.65	464.05	122.40	453.02	13.27	43.26	14.30
S05	511861	7168037	3.00	43.79	463.34	81.61	454.37	13.34	69.99	7.30
S06	512274	7167977	3.00	39.73	460.65	57.60	456.48	13.13	150.72	1.58
S07	512677	7168290	1.00	64.78	458.48	82.71	453.95	14.19	100.53	2.58
S08	512689	7168234	1.00	61.97	458.59	70.97	457.49	6.94	135.88	0.46
S09	512758	7168242	1.00	75.66	461.47	99.55	459.00	5.90	193.60	0.73
S10	512849	7168297	1.00	70.00	461.35	83.00	458.85	10.91	260.39	0.55
S11	549445	7187806	3.00	80.93	454.58	108.90	448.76	11.75	91.03	3.66
S12	511971	7167745	3.00	35.80	471.36	83.53	461.75	11.39	128.46	4.28
S13	512007	7167717	3.00	49.97	474.05	71.96	465.05	22.26	114.29	4.50
S14	511928	7167742	3.00	32.77	467.55	60.57	460.39	14.43	146.83	2.79
S15	511949	7167712	3.00	46.80	472.22	56.75	470.54	9.61	157.89	0.61
S16	511857	7167375	1.00	33.97	474.92	62.95	467.00	15.29	158.33	2.86
S17	512055	7167385	1.00	50.91	485.02	87.85	472.08	19.32	250.54	2.96
S18	512314	7167540	1.00	88.70	468.14	104.65	465.28	10.16	125.90	1.30
S19	512427	7167475	1.00	78.80	475.70	94.76	469.28	21.92	147.84	2.49
S20	512451	7167394	1.00	46.69	475.43	69.54	473.28	5.38	197.42	0.62
S21	512419	7167348	1.00	80.84	478.75	112.77	474.29	7.94	169.18	1.51
S22	512375	7167293	1.00	64.90	480.65	89.87	476.59	9.24	98.59	2.36
S23	512235	7167231	1.00	71.58	486.57	111.35	476.30	14.49	82.56	7.10
S24	511897	7167182	2.00	87.43	480.84	121.22	472.68	13.58	212.68	2.20
S25	511619	7167155	3.00	107.51	487.79	148.32	482.87	6.88	230.48	1.22
S26	511840	7167004	1.00	130.54	480.34	159.44	476.43	7.70	49.32	4.53
S27	512362	7166998	2.00	110.88	481.86	139.84	478.20	7.21	173.77	1.21
S28	512723	7167383	2.00	73.98	482.12	98.98	481.00	2.57	229.78	0.28
S29	513137	7167207	3.00	65.97	470.38	92.95	469.54	1.78	92.79	0.52
S30	512594	7167735	3.00	72.94	471.20	52.96	466.23	13.98	140.58	2.03
S31	514797	7167008	3.00	89.67	487.35	140.48	483.51	4.32	348.09	0.63
S32	516219	7168651	2.00	94.53	467.64	107.47	465.46	9.56	295.03	0.42
S33	516294	7168943	2.00	165.83	472.97	176.82	469.52	17.43	275.72	0.72
S34	516407	7168770	2.00	112.85	464.99	155.80	453.76	14.66	97.91	6.54
S35	516081	7168888	3.00	80.87	473.17	119.81	469.72	5.06	362.33	0.55
S36	516222	7168326	3.00	75.90	464.75	104.86	461.29	6.82	298.27	0.67
S37	516201	7168183	3.00	56.52	468.05	76.35	465.42	7.56	181.02	0.83
S38	516337	7168180	3.00	65.53	464.76	98.31	461.65	5.43	189.95	0.94
S39	516063	7168156	2.00	51.78	469.02	62.74	466.49	12.98	135.21	1.07
S40	516524	7168161	3.00	74.75	462.84	89.71	459.88	11.19	82.64	2.05
S41	516865	7168333	1.00	53.90	463.49	75.85	458.13	13.72	195.26	1.57
S42	516802	7168259	1.00	80.73	463.53	122.59	457.39	8.34	155.50	2.26

SITE_ID	POINT_X	POINT_Y	Class	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	DEGREE_HS	DIST_W	SLOPE_W
S43	516994	7167873	2.00	73.97	473.75	46.98	470.15	7.61	193.38	1.07
S44	517051	7167992	2.00	63.87	463.52	131.74	457.33	5.21	162.06	2.19
S45	516914	7167665	2.00	35.89	476.70	28.91	475.90	6.55	248.91	0.18
S46	516882	7167810	1.00	72.62	477.05	95.50	473.27	9.39	230.97	0.94
S47	516713	7167679	3.00	67.94	475.94	97.91	474.66	2.46	216.59	0.34
S48	516756	7167670	2.00	55.79	475.99	80.70	473.74	5.14	258.44	0.50
S49	516802	7167695	2.00	44.73	477.37	53.67	475.86	9.57	281.01	0.31
S50	516682	7167535	3.00	48.71	476.46	69.59	473.51	8.04	247.90	0.68
S51	548995	7187364	2.00	51.52	467.25	100.07	464.49	3.25	209.50	0.75
S52	516613	7167545	1.00	49.74	475.36	87.54	469.88	8.26	213.22	1.47
S53	516576	7167500	2.00	46.91	472.55	76.85	470.88	3.19	157.68	0.61
S54	517046	7167499	3.00	87.93	472.93	111.91	467.12	13.62	51.03	6.49
S55	517101	7167594	2.00	91.56	475.30	131.36	469.86	7.78	138.69	2.24
S56	516986	7167762	2.00	41.86	474.14	64.78	471.80	5.82	291.91	0.46
S57	517219	7167838	3.00	104.70	475.11	130.62	469.89	11.39	370.98	0.81
S58	517341	7167928	1.00	88.62	473.86	143.39	466.68	7.47	251.68	1.63
S59	517472	7167908	1.00	122.63	473.90	145.56	469.26	11.44	254.79	1.04
S60	517518	7167809	3.00	49.75	473.86	119.40	466.36	6.14	360.85	1.19
S61	517470	7167738	3.00	65.89	476.74	146.75	466.22	7.41	381.44	1.58
S62	517450	7167670	2.00	48.76	472.56	72.64	466.52	14.20	320.39	1.08
S63	517391	7167633	2.00	55.94	472.03	77.91	465.98	15.38	251.01	1.38
S64	517513	7168108	1.00	75.95	464.35	133.89	456.98	7.25	92.26	4.57
S65	517449	7168047	1.00	62.98	467.94	96.97	466.11	3.08	114.17	0.92
S66	517378	7168068	2.00	51.56	467.04	99.16	461.31	6.87	108.17	3.03
S67	517423	7168131	2.00	39.95	459.88	57.93	452.99	20.97	32.10	12.12
S68	516891	7166987	2.00	75.93	470.55	104.91	468.03	4.96	220.87	0.65
S69	516960	7167054	2.00	101.88	470.98	115.87	468.61	9.64	145.82	0.93
S70	516936	7167033	2.00	80.69	470.94	97.63	468.12	9.47	169.63	0.95
S71	517793	7167330	2.00	115.73	475.73	171.60	468.58	7.29	105.22	3.89
S72	518049	7167558	1.00	101.90	480.92	126.88	473.24	17.10	232.14	1.90
S73	518263	7167628	3.00	118.53	476.39	156.39	473.24	4.75	400.31	0.45
S74	517927	7167448	2.00	55.94	474.85	99.90	469.79	6.56	131.01	2.21
S75	518197	7167383	1.00	70.74	474.66	166.40	472.42	1.34	169.48	0.76
S76	518098	7167309	2.00	65.90	472.85	107.84	468.59	5.80	48.93	4.97
S77	548703	7186755	3.00	83.79	464.68	98.77	461.33	12.59	243.67	0.79
S78	517757	7167247	2.00	87.98	472.35	122.97	468.65	6.03	60.94	3.47
S79	518172	7167245	1.00	55.95	472.67	107.90	469.50	3.49	62.81	2.89
S80	518238	7167285	1.00	64.64	474.21	76.57	473.47	3.58	137.18	0.31
S81	518644	7167450	2.00	71.60	476.85	117.35	470.83	7.50	575.83	0.60
S82	518530	7167393	2.00	86.91	477.98	100.89	474.84	12.65	448.76	0.40
S83	518525	7167918	3.00	43.90	474.98	70.84	471.27	7.84	497.18	0.43
S84	519091	7168623	3.00	67.76	485.22	55.80	481.47	17.42	571.81	0.38

SITE_ID	POINT_X	POINT_Y	Class	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	DEGREE_HS	DIST_W	SLOPE_W
S85	518154	7168034	3.00	75.70	468.71	107.58	461.70	12.42	119.53	3.36
S86	517997	7167745	2.00	107.82	476.10	142.76	467.51	13.80	267.90	1.84
S87	517574	7167858	3.00	35.98	469.59	57.97	465.57	10.36	332.08	0.69
S88	517641	7168015	3.00	57.00	466.21	114.00	460.31	5.91	232.98	1.45
S89	516959	7168226	2.00	47.74	457.75	96.48	450.29	8.70	111.75	3.82
S90	519276	7168615	3.00	68.71	484.04	78.66	481.61	13.69	394.45	0.35
S91	519514	7168599	3.00	81.94	471.00	145.90	461.30	8.62	159.54	3.48
S92	518407	7168782	3.00	112.84	471.47	156.80	463.40	10.40	162.39	2.84
S93	533355	7162397	2.00	117.80	486.30	134.78	480.16	19.89	286.00	1.23
S94	533320	7162535	2.00	102.89	488.49	158.83	478.19	10.43	223.68	2.64
S95	533338	7162688	2.00	101.60	476.26	124.50	472.60	9.08	275.86	0.76
S96	533230	7162778	2.00	113.67	479.50	178.47	473.24	5.52	233.02	1.54
S97	532820	7162707	1.00	122.57	481.12	137.52	476.97	15.54	54.95	4.33
S98	533058	7162565	2.00	57.78	487.66	103.61	478.46	11.34	0.00	N/A
S99	533844	7162226	2.00	67.70	492.38	73.68	489.90	22.59	66.77	2.13
S100	534012	7162274	2.00	106.52	486.53	133.40	483.14	7.19	233.69	0.83
S101	533992	7162085	3.00	43.86	484.26	80.74	480.92	5.18	155.21	1.24
S102	528853	7163547	3.00	91.68	430.99	100.65	429.24	11.04	263.89	0.38
S103	519194	7168834	3.00	77.66	482.41	65.71	479.85	12.10	465.59	0.32
S104	520165	7169569	3.00	74.97	448.17	137.95	438.93	8.35	110.24	4.79
S105	520095	7169604	3.00	51.98	445.80	71.97	442.24	10.08	176.07	1.16
S106	520026	7169457	3.00	66.61	450.23	92.46	447.28	6.51	159.67	1.06
S107	520000	7169658	3.00	48.97	445.11	70.95	442.32	7.22	209.34	0.76
S108	512788	7167421	3.00	39.89	480.80	54.85	478.75	7.79	253.26	0.46
S109	512828	7168446	2.00	55.67	458.65	89.46	455.14	5.93	229.75	0.88
S110	548897	7187228	2.00	82.65	462.60	123.48	453.88	12.05	135.80	3.67
S111	555684	7175100	3.00	71.97	442.41	86.96	440.05	8.95	200.09	0.68
S112	553534	7182672	2.00	111.66	471.46	124.63	467.58	16.66	157.41	1.41
S113	552018	7184314	1.00	154.89	461.42	168.87	456.28	20.16	18.50	15.51
S114	548616	7188772	2.00	47.92	456.75	76.88	453.34	6.71	124.12	1.57
S115	549409	7187705	2.00	94.00	455.76	159.00	445.11	9.30	82.44	7.36
S116	548726	7187185	1.00	88.69	459.60	129.54	456.65	4.12	66.85	2.52
S117	549083	7187108	1.00	118.31	458.86	159.08	456.55	3.24	156.26	0.85
S118	548985	7187242	1.00	63.88	461.68	108.79	453.90	9.82	181.59	2.45
S119	549017	7187282	1.00	74.87	463.37	147.74	455.08	6.48	155.82	3.04
S120	548545	7187030	1.00	75.97	454.80	111.96	449.58	8.26	140.60	2.13
S121	548491	7187160	1.00	64.69	460.53	109.47	454.22	8.02	67.07	5.37
S122	549326	7187825	1.00	85.87	462.66	69.89	461.39	4.55	191.48	0.38
S123	548295	7188007	3.00	59.74	461.90	118.48	459.63	2.21	74.01	1.75
S124	549201	7187730	2.00	109.55	468.95	133.45	466.85	5.04	229.86	0.53
S125	549368	7187089	2.00	84.79	464.13	150.63	452.85	9.72	107.50	5.99
S126	547895	7187036	3.00	89.98	454.49	142.96	448.36	6.59	112.33	3.12

SITE_ID	POINT_X	POINT_Y	Class	RMAX_X	RMAX_Y	RMIN_X	RMIN_Y	DEGREE_HS	DIST_W	SLOPE_W
S127	548445	7189157	1.00	65.77	455.36	95.67	453.64	3.30	119.77	0.82
S128	548904	7188963	2.00	75.82	448.08	68.84	447.50	4.77	99.35	0.34
S129	548666	7188889	1.00	44.75	453.54	58.68	452.28	5.21	84.72	0.86
S130	548540	7188784	3.00	96.82	458.20	134.76	453.91	6.45	112.32	2.19
S131	548788	7188649	2.00	41.83	451.40	85.66	448.81	3.39	195.82	0.76
S132	548836	7188790	1.00	78.80	450.12	118.70	447.69	3.49	118.05	1.18
S133	548586	7188874	2.00	31.79	453.30	70.52	451.49	2.67	18.50	5.58
S134	548385	7189174	2.00	56.98	456.16	77.97	455.24	2.49	171.49	0.31
S135	548228	7189151	3.00	56.89	458.99	100.80	453.32	7.36	288.94	1.12
S136	540798	7198526	3.00	71.79	490.27	126.62	486.77	3.65	133.39	1.50
S137	540828	7198648	2.00	104.30	486.32	146.02	482.83	4.78	250.28	0.80
S138	541057	7198556	3.00	66.76	489.66	155.44	483.76	3.81	235.04	1.44
S139	541005	7198472	1.00	112.74	492.18	143.67	490.52	3.08	223.66	0.43
S140	533677	7162507	1.00	93.87	479.14	134.82	467.31	16.12	330.68	2.05
S141	540666	7198544	1.00	36.76	487.64	41.72	486.55	12.43	139.24	0.45
S142	540544	7198838	3.00	76.82	489.98	102.76	488.31	3.69	254.24	0.38
S143	540529	7198506	2.00	41.76	485.72	138.20	480.05	3.36	205.06	1.58
S144	556262	7175232	1.00	183.99	459.49	369.98	434.59	7.63	123.32	11.42
S145	556205	7175835	1.00	168.82	451.29	177.81	446.50	28.02	77.60	3.53
S146	555531	7175139	1.00	87.95	443.74	121.93	439.19	7.63	158.42	1.65
S147	555976	7175364	1.00	124.73	452.49	151.67	450.06	5.14	196.21	0.71
S148	549049	7187375	3.00	50.61	464.16	92.30	459.86	5.88	167.38	1.47
S149	548893	7187299	2.00	20.82	469.36	58.65	467.33	3.07	199.45	0.58
S150	548440	7189247	2.00	107.86	456.15	155.80	452.98	3.78	203.86	0.89
S151	549614	7186931	1.00	97.99	452.78	111.99	449.56	12.96	149.08	1.24
S152	511644	7167326	2.00	84.53	475.80	129.28	469.60	7.89	94.17	3.77

APPENDIX C – SUMMARY STATISTICS

Class 1

	Minimum	1st Quartile	Median	Mean	3rd Quartile	Max
Total Height (m)	0.0	4.0	6.1	6.8	8.7	25.4
Total Length (m)	33.0	76.0	112.0	121.6	159.5	430.0
Hillslope (°)	1.5	5.8	7.8	9.0	11.4	38.9
Trough Depth (m)	0.0	0.2	0.4	0.5	0.7	1.8
Trough Width (m)	2.0	5.0	7.0	7.6	9.0	16.9

Class 2

	Minimum	1st Quartile	Median	Mean	3rd Quartile	Max
Total Height (m)	0.4	1.5	2.1	2.6	3.7	6.0
Total Length (m)	56.0	85.0	104.5	133.8	184.0	315.0
Hillslope (°)	2.2	3.2	5.6	7.0	9.5	18.9
Trough Depth (m)	0.0	0.4	0.6	0.6	0.8	1.1
Trough Width (m)	4.0	6.0	8.9	8.4	10.0	14.9

Class 3

	Minimum	1st Quartile	Median	Mean	3rd Quartile	Max
Total Height (m)	0.1	0.9	2.3	3.1	4.1	15.3
Total Length (m)	43.0	90.0	117.0	122.8	135.0	241.0
Hillslope (°)	1.3	3.8	7.8	9.0	13.3	22.6

All Classes

	Minimum	1st Quartile	Median	Mean	3rd Quartile	Max
Elevation (m asl)	429.2	455.6	466.6	464.9	473.2	490.5
Total Height (m)	0.0	2.7	5.2	5.8	7.9	25.4
Total Length (m)	33.0	76.3	112.0	123.0	159.0	430.0
Hillslope (°)	1.3	5.4	7.7	8.8	11.4	38.9
Distance to Water (m)	18.5	116.2	167.4	187.2	234.2	575.8
Slope to Water (%)	0.2	0.7	1.2	2.2	2.6	15.5
Trough Depth (m)	0.0	0.2	0.4	0.5	0.7	1.8
Trough Width (m)	2.0	5.9	7.0	7.7	9.0	16.9