

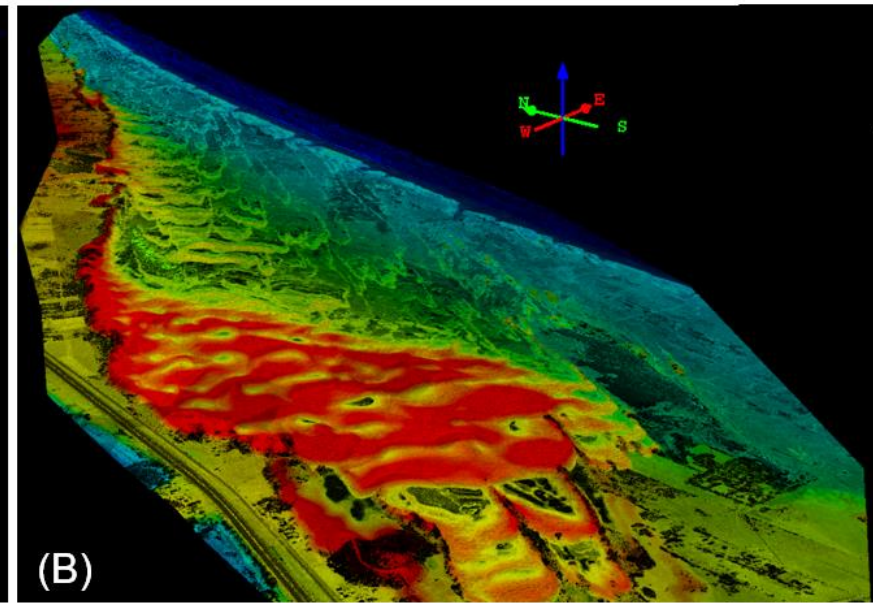
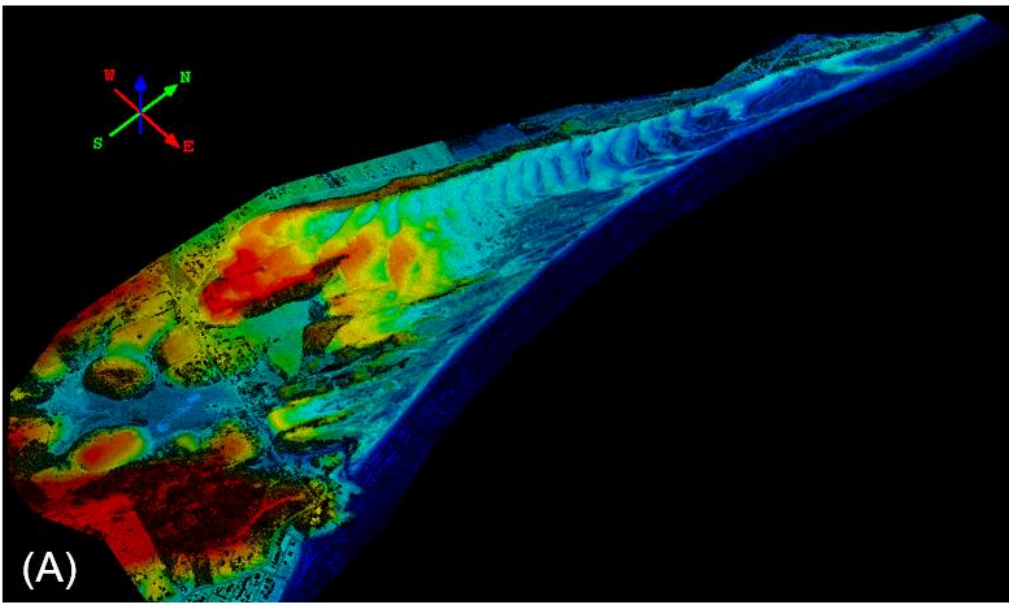


Earth Science Applications of LiDAR (1)

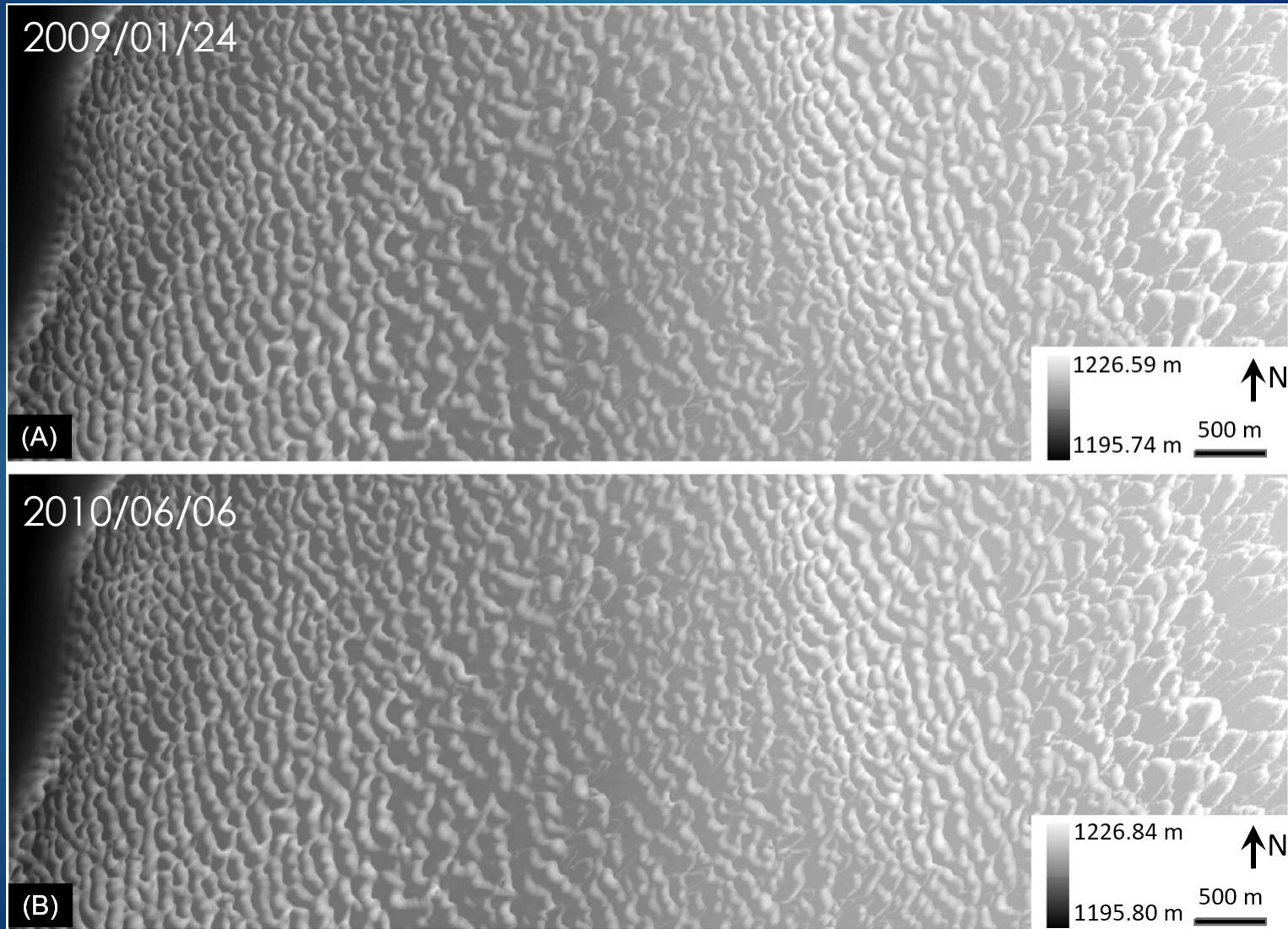
Urban Applications of LiDAR (1)

- 6.1 Introduction
- 6.2 Aeolian Landforms
- 6.3 Fluvial Landforms
- 6.4 Surface Hydrology
- 6.5 Volcanic and Impact Landforms
- 6.6 Tectonic Landforms
- 6.7 Lithology and Geologic Structures

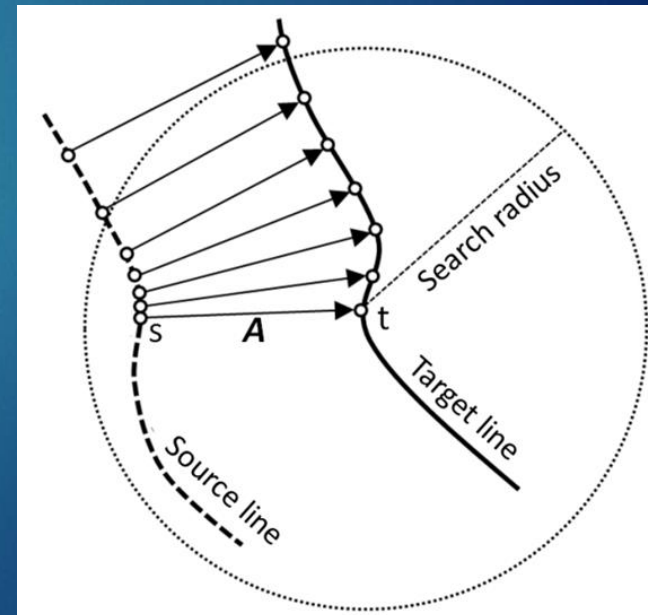
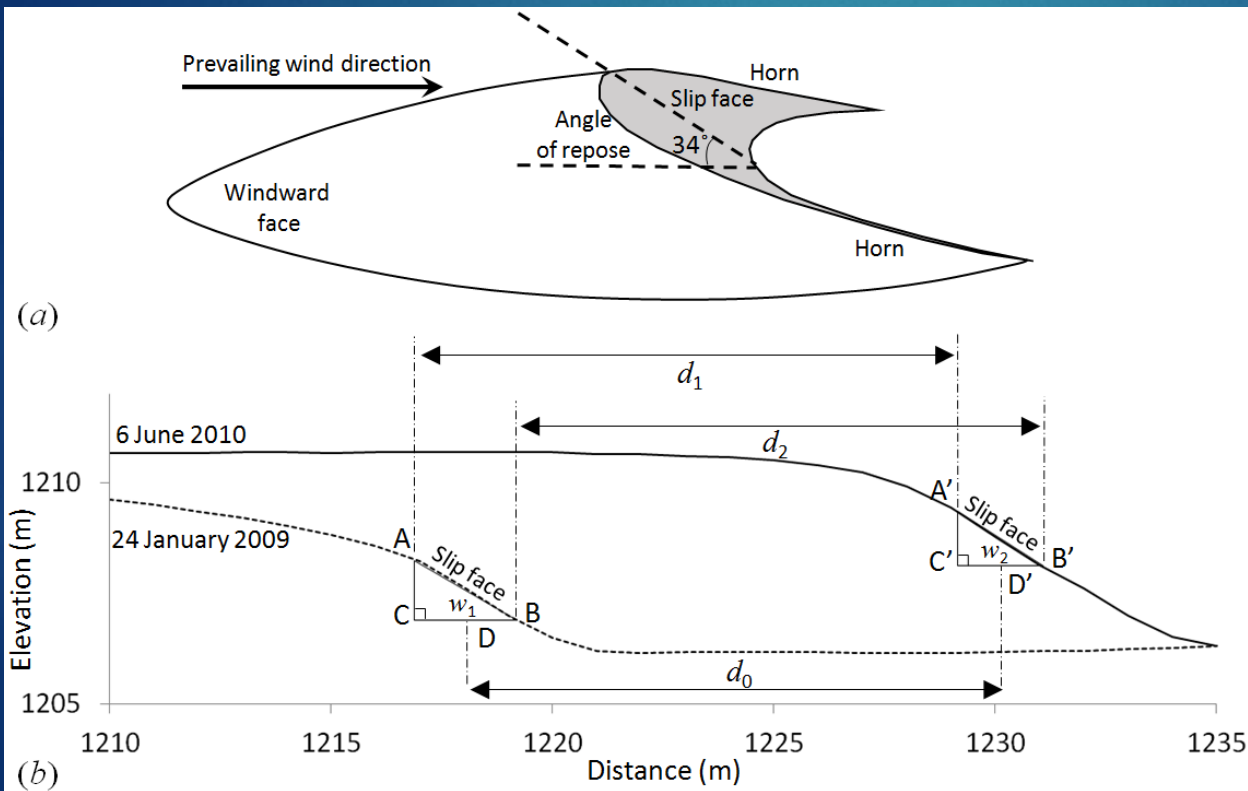
LiDAR Data for Coastal Sand Dunes in Santa Catarina (Brazil)



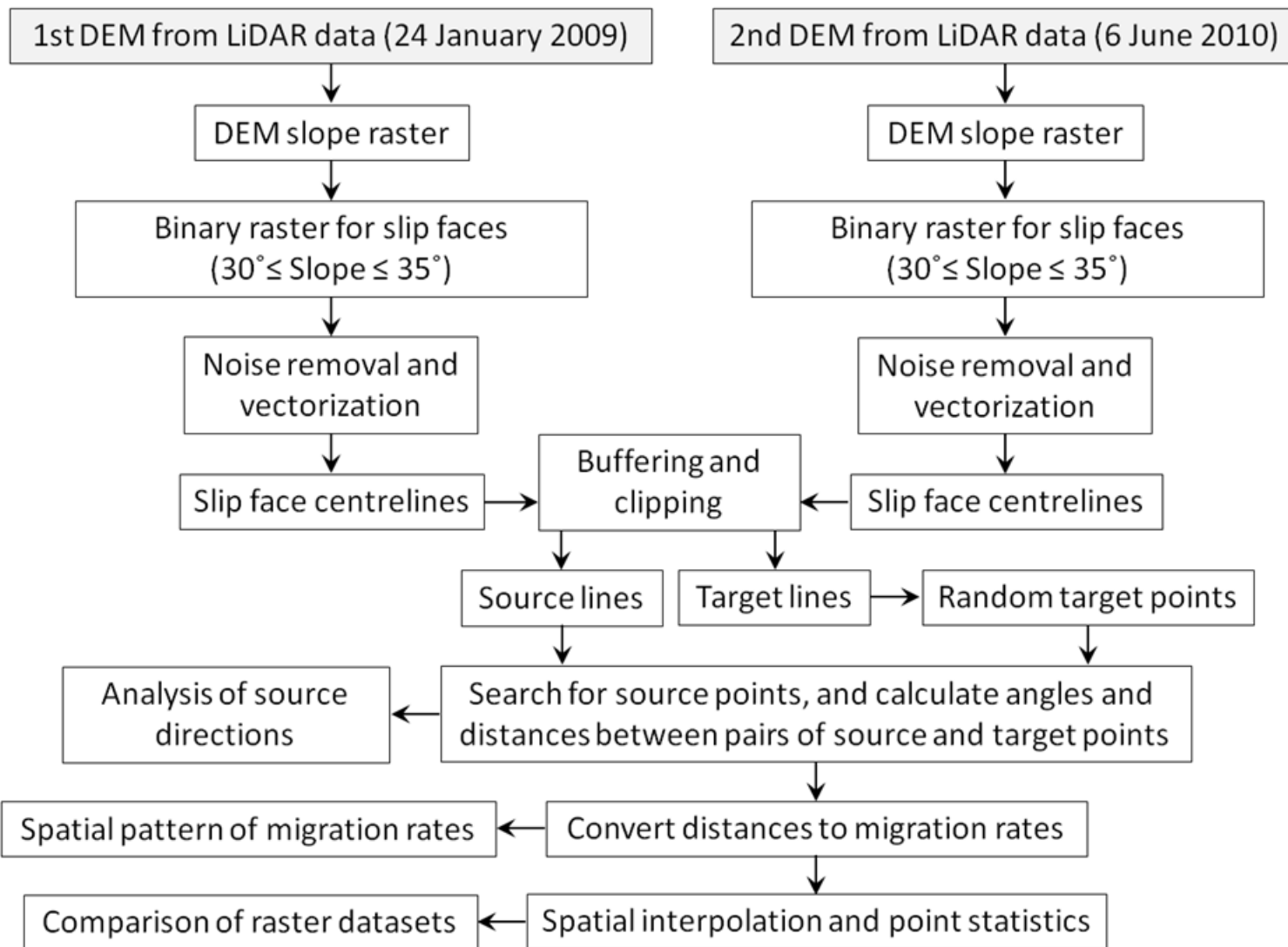
LiDAR-derived DTMs for the White Sands Dune Field (WSDF), NM



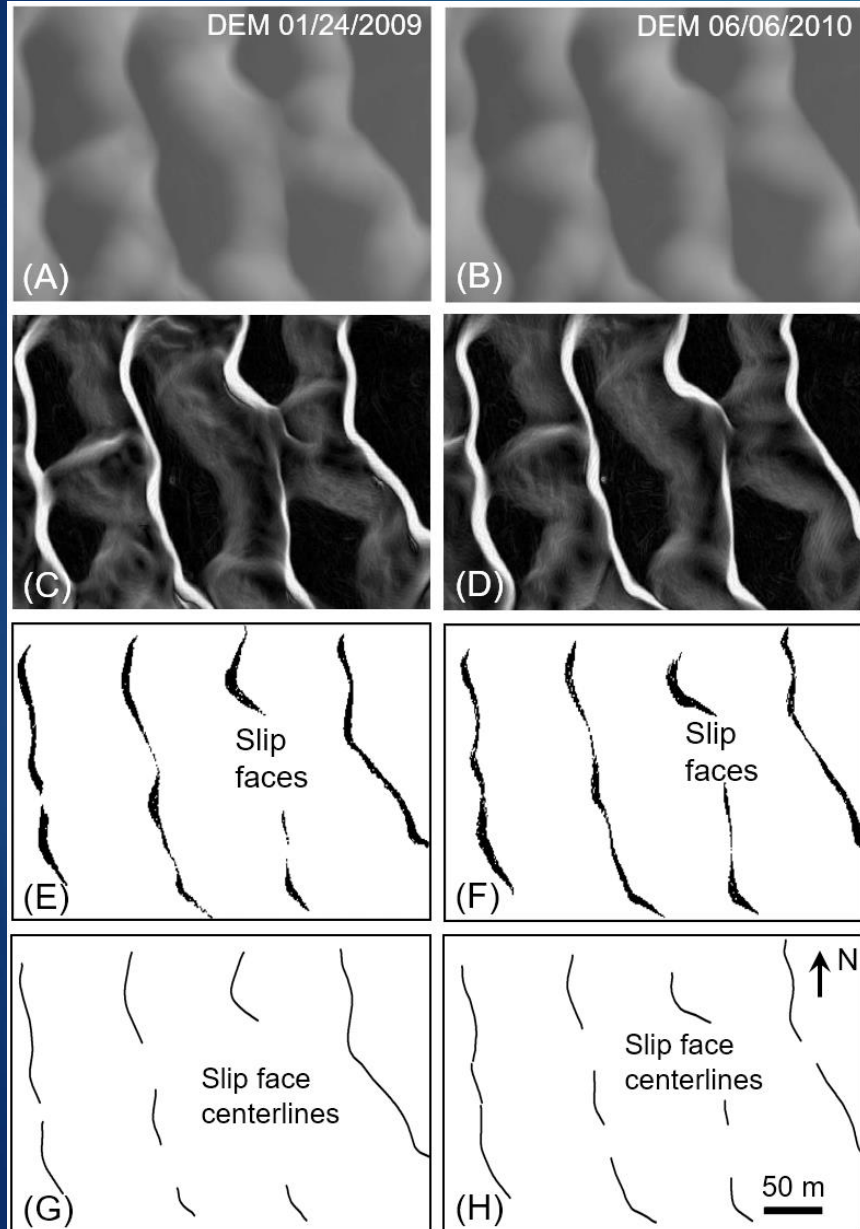
Pairs of Source and Target Points (PSTP) on Sand Dune Slipfaces



Flowchart for Measuring Sand Dune Migration Rates

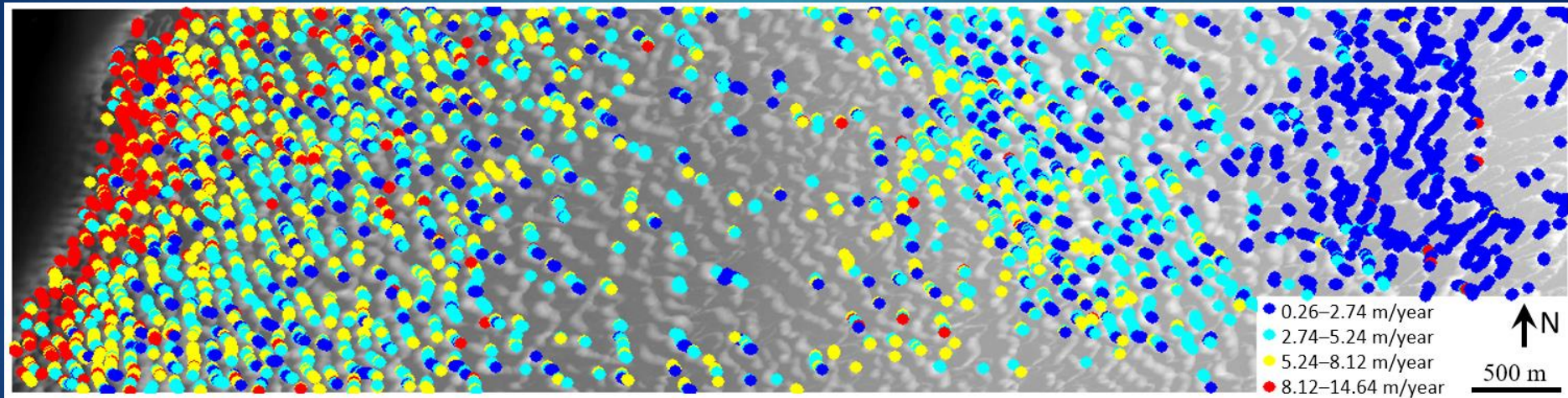


From DTM to Slipface Centerlines

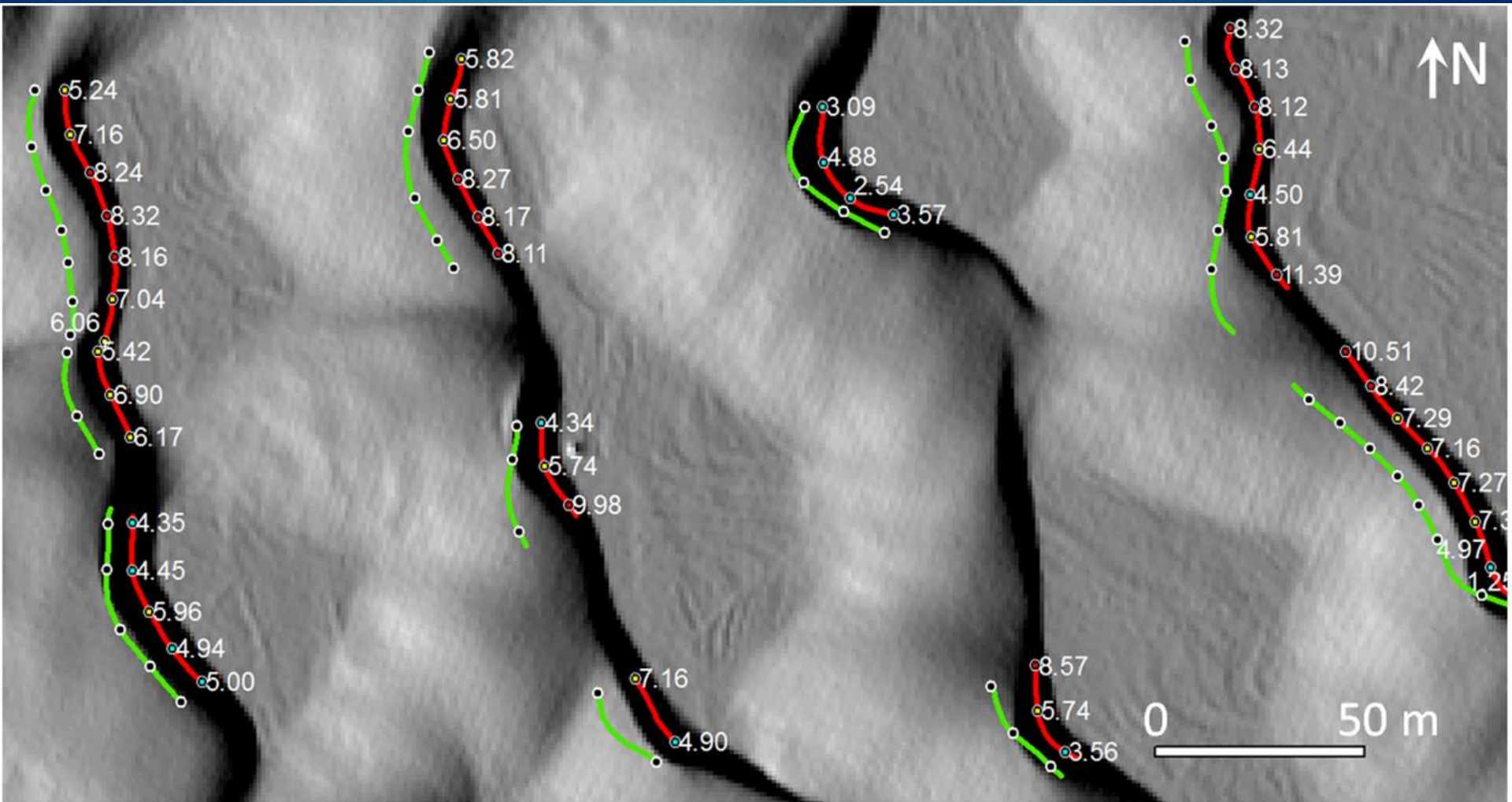


(A) and (B): Digital terrain models for January 24, 2009 and June 6, 2010. (C) and (D): Slope rasters derived from DEMs. (E) and (F): Binary rasters for slip faces extracted from DEM slopes by setting values between 30° and 35° to 1, and other values to 0. (G) and (H): Vectorized centrelines for slip faces.

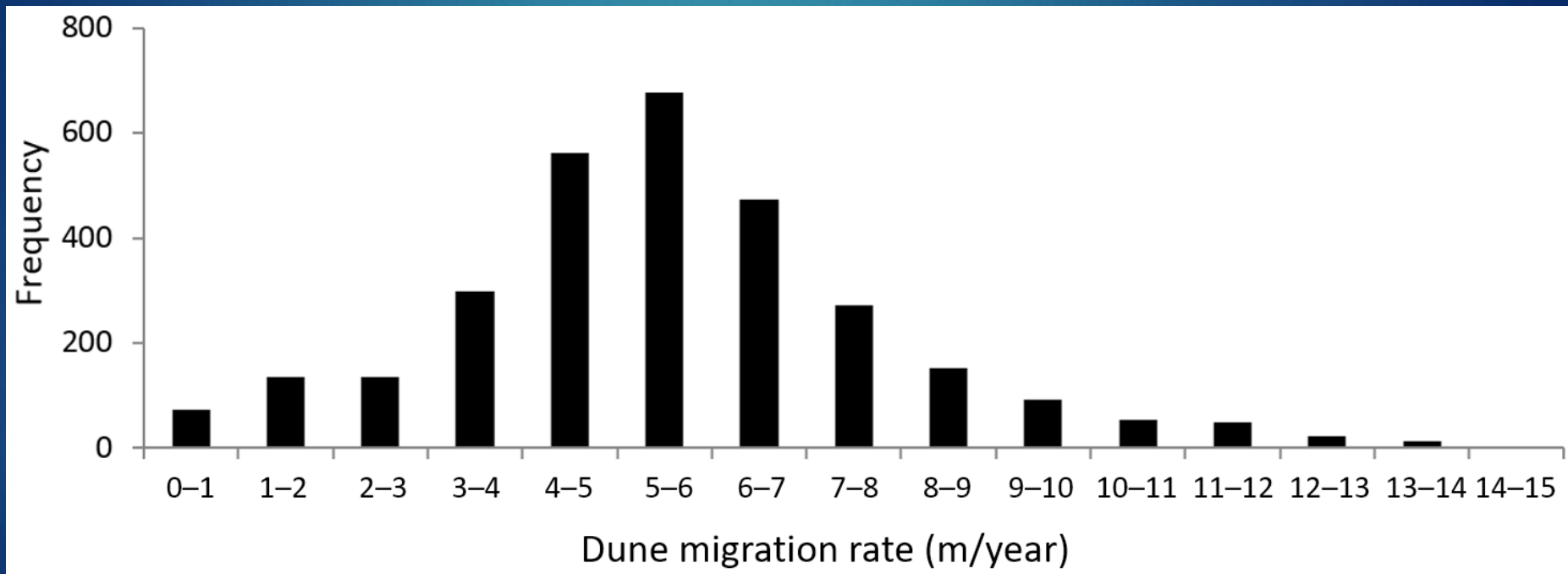
Dune Migration Rates at Point Locations



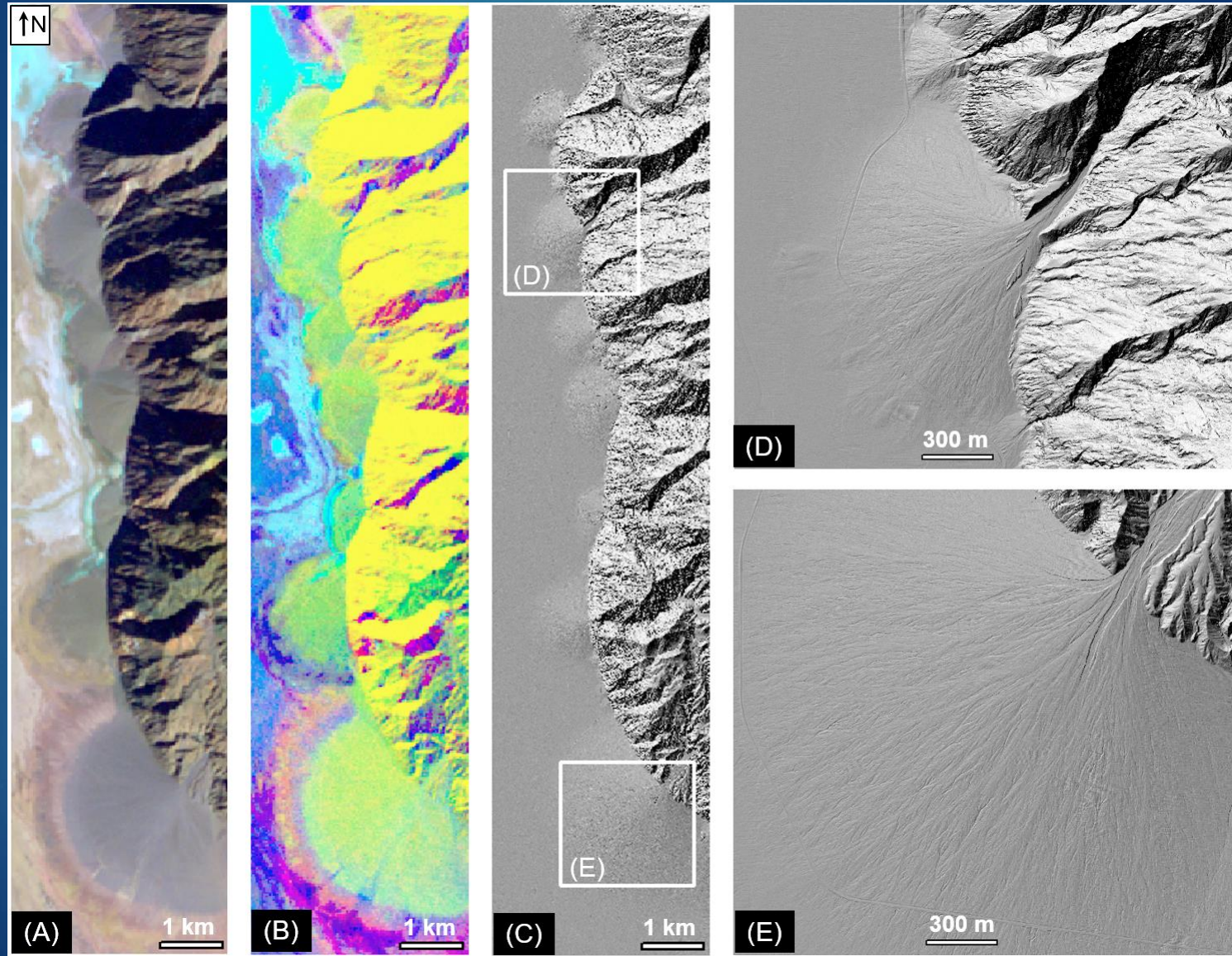
Dune Migration Rates at Point Locations



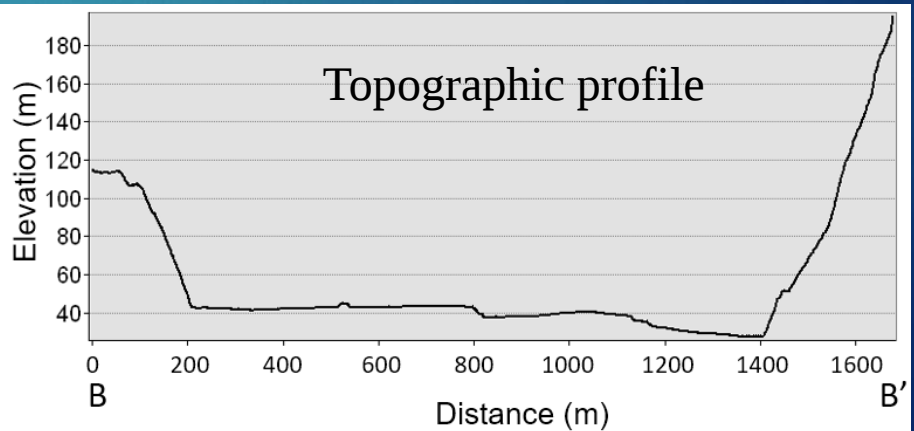
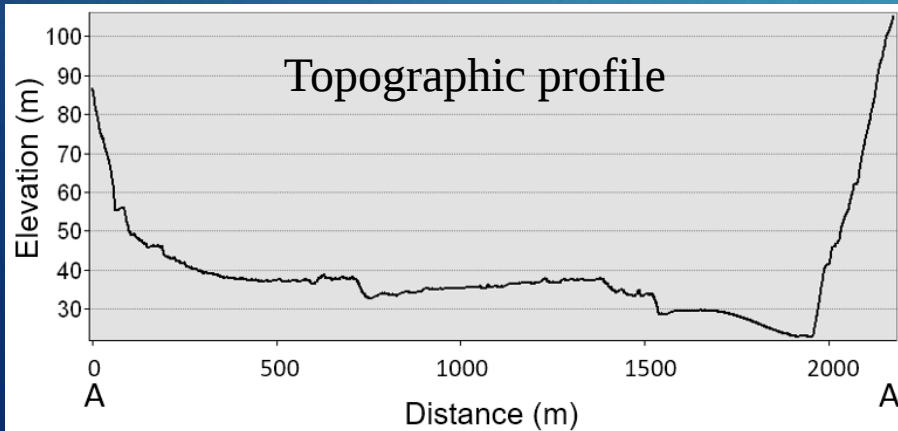
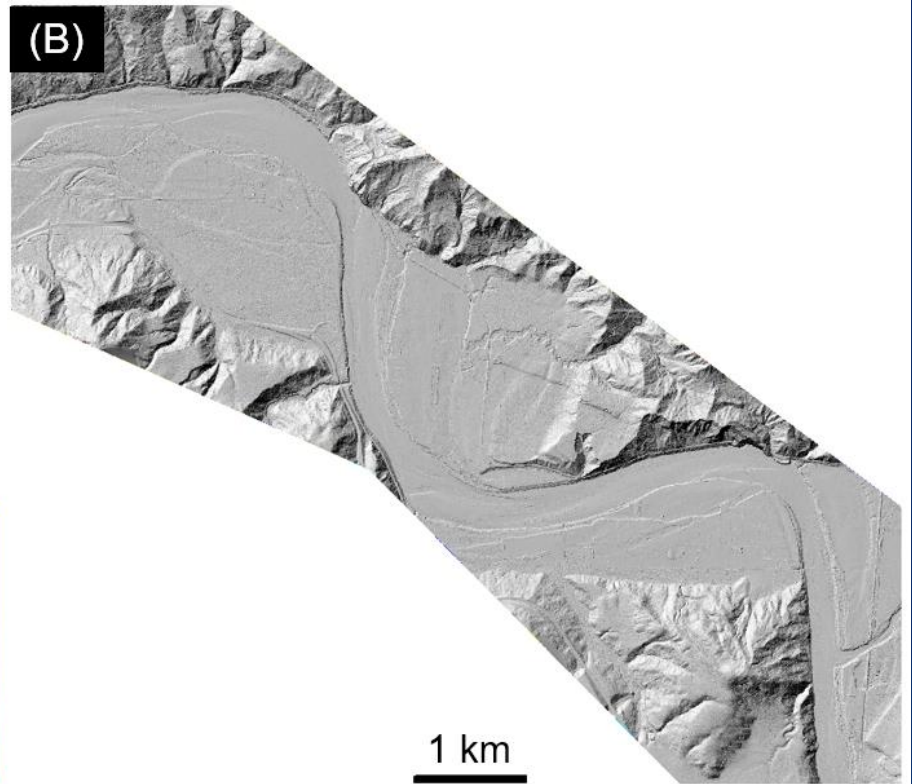
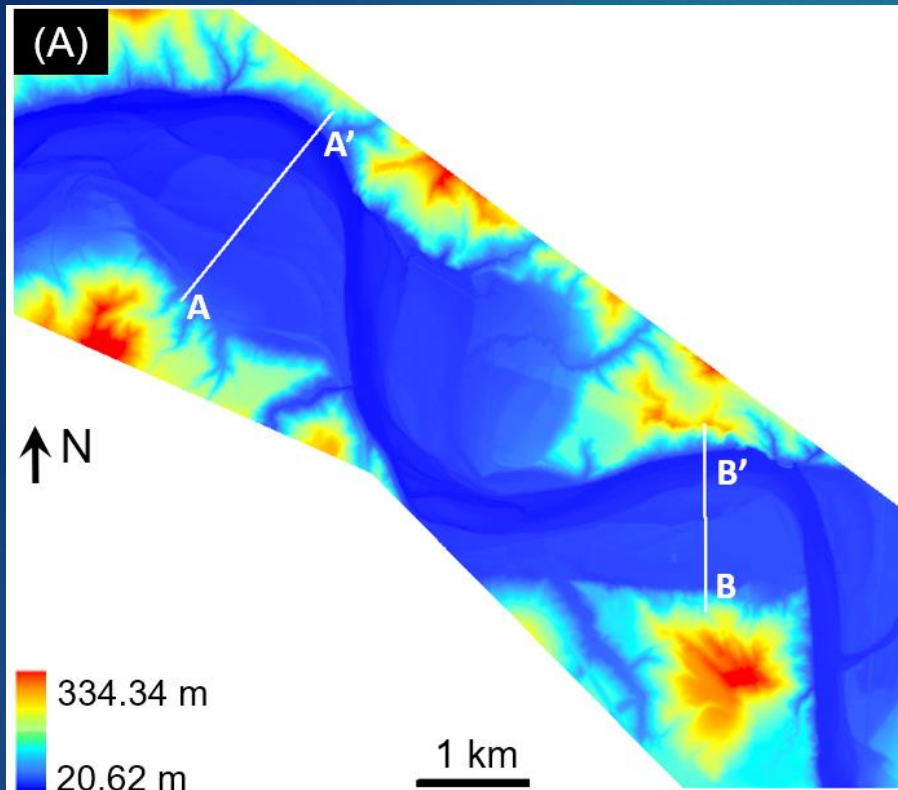
Distribution of Dune Migration Rates



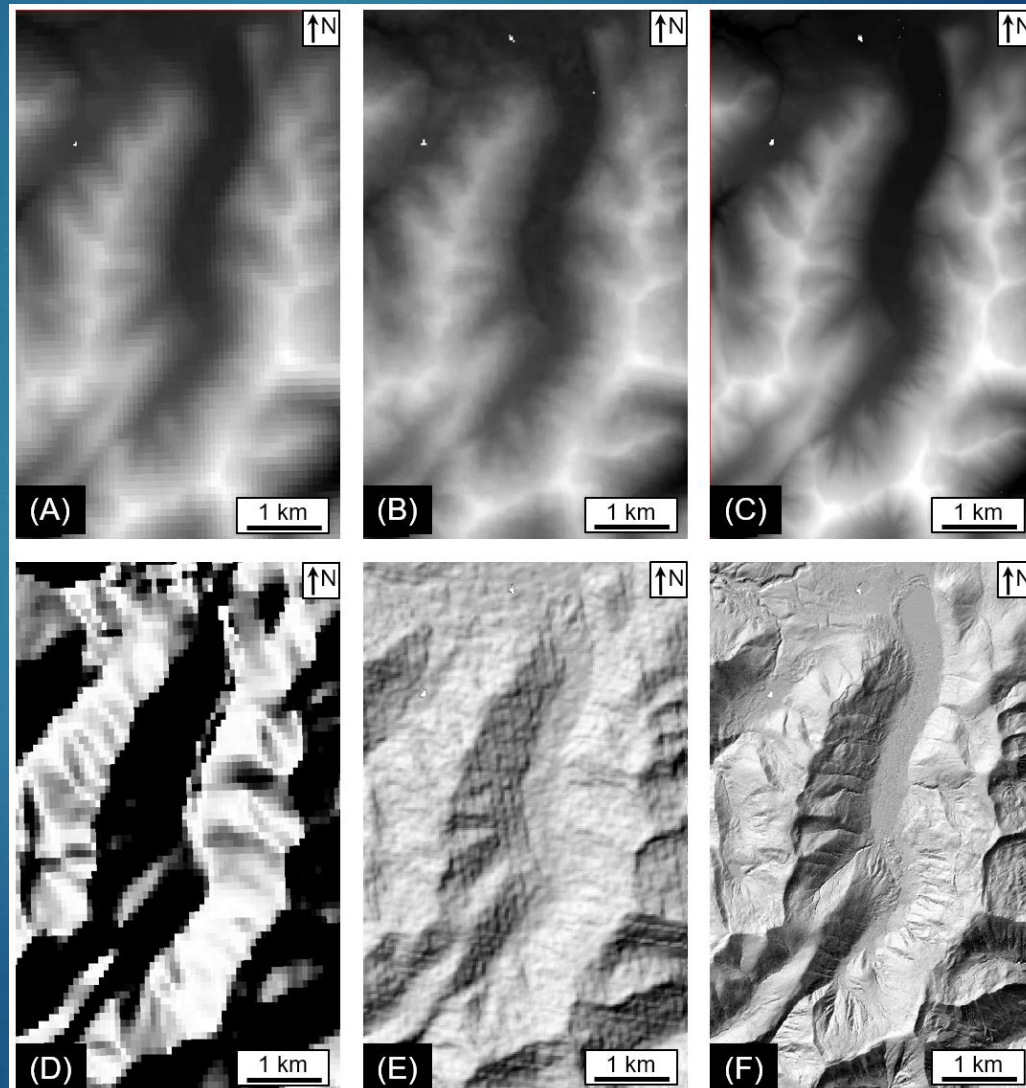
Alluvial Fans in Death Valley, CA



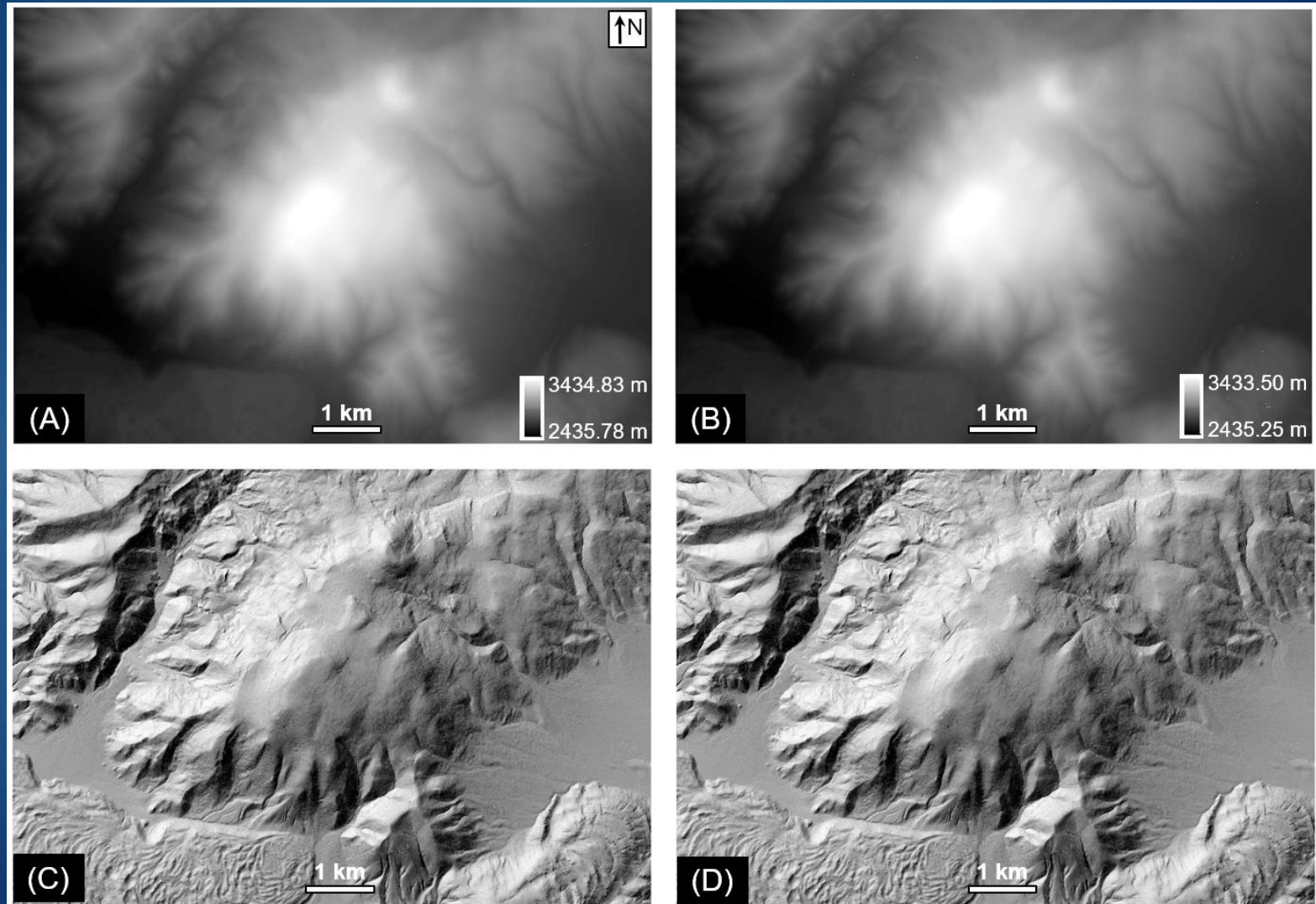
DTM of South Fork Eel River, CA



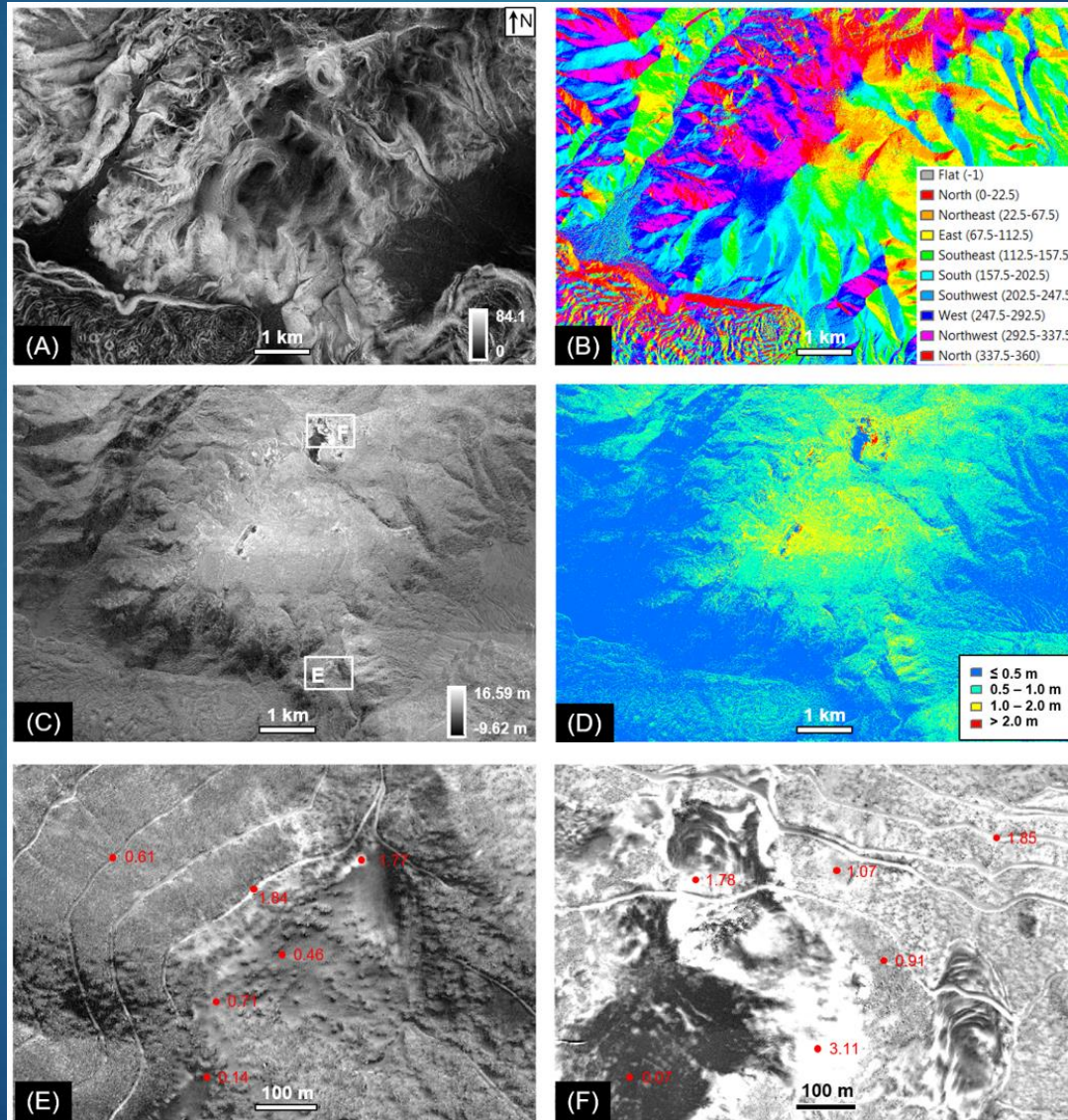
Comparison of DTMs derived from 90-m resolution SRTM (A and D), 30-m resolution ASTER GDEM (B and E), and 1-m resolution LiDAR-derived DEM (C and F) for a watershed in the Sawtooth National Forest, Idaho.



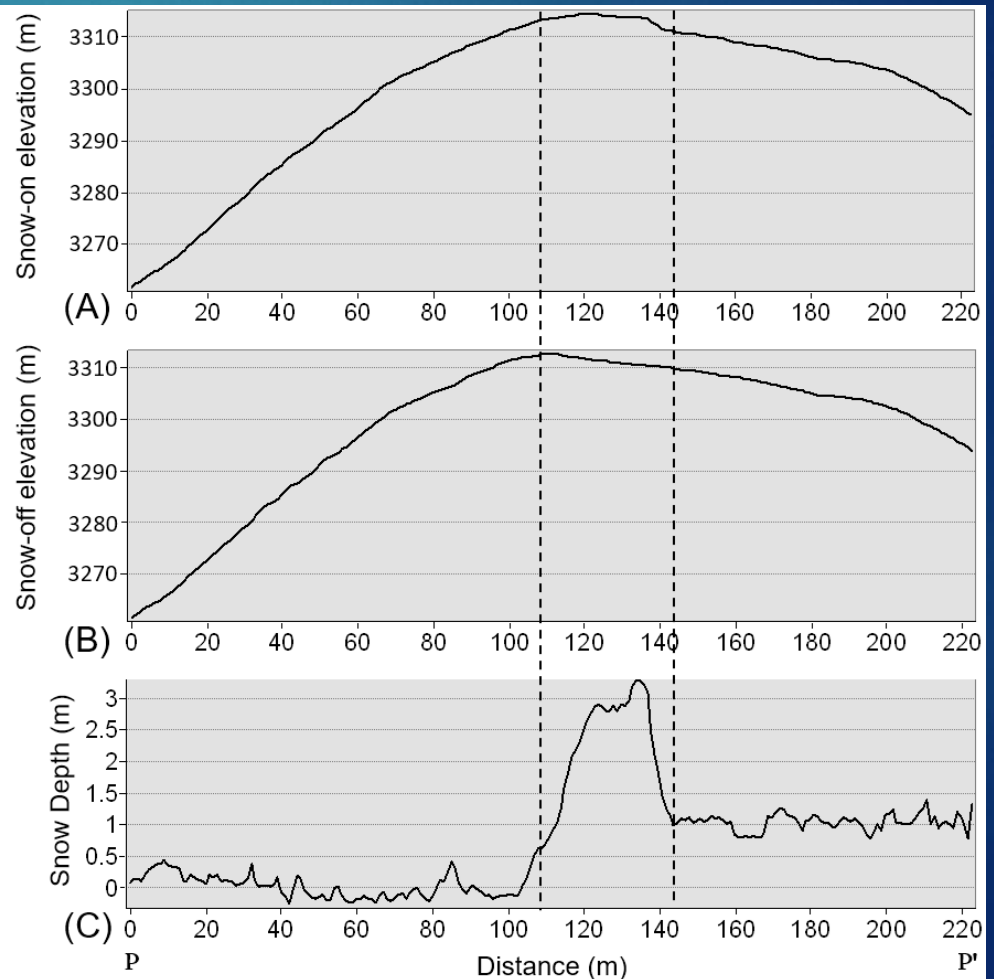
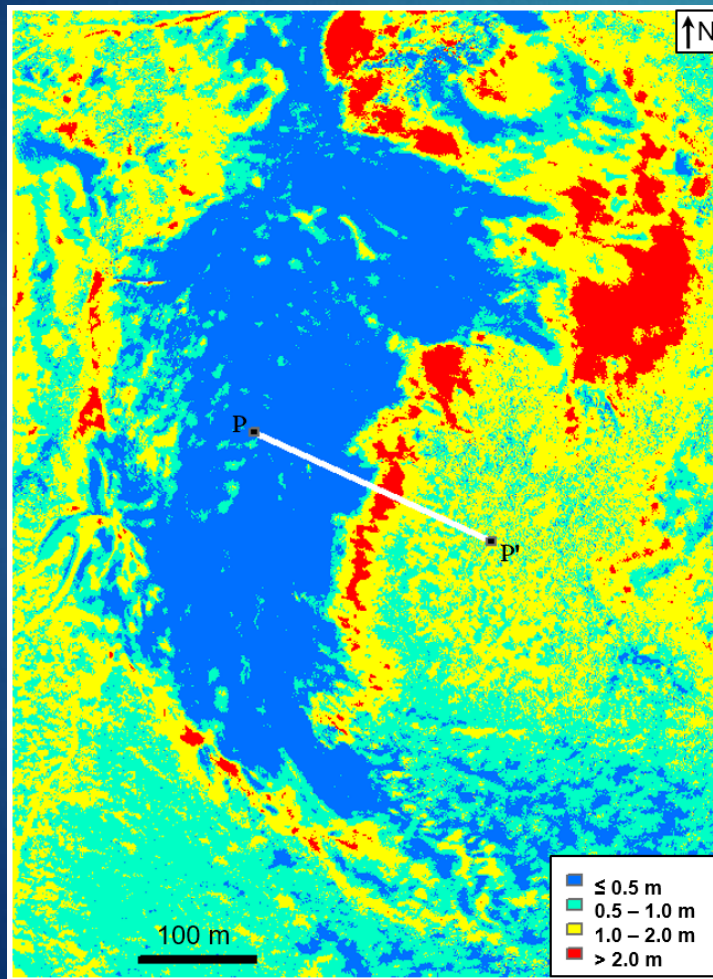
Original DTM and shaded DTM obtained from snow-on (A and C) and snow-off (B and D) LiDAR data collected in the upper Jerez river basin, New Mexico (USA).



Topographic slope, aspect, and snow-depth distribution. (A) slope; (B) aspect; (C) snow depth map; (D) classified snow-depth map; (E) snow depth (red numbers) for box E in (C); (F) snow depth (red text) for box F in (C).

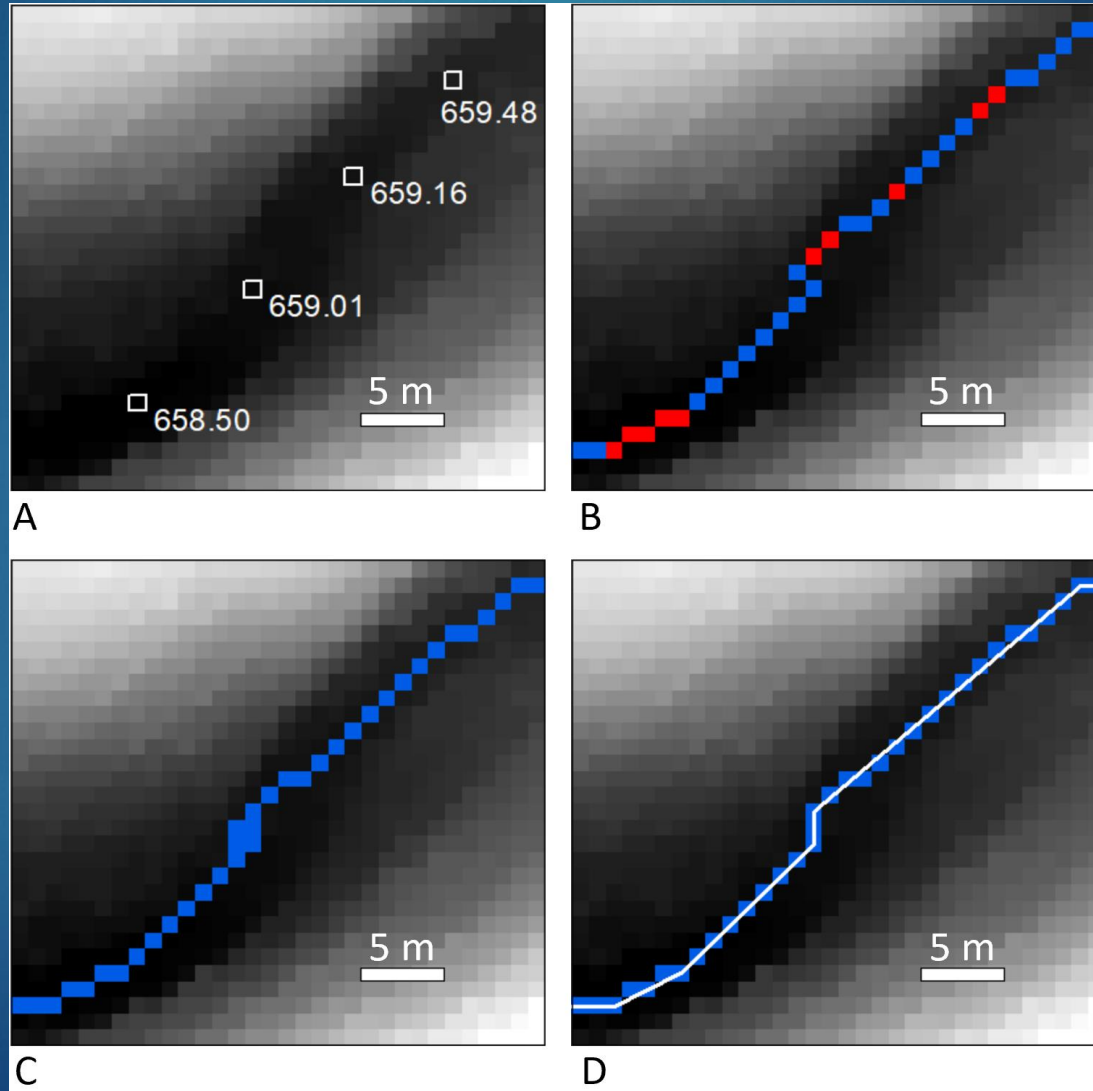


Classified snow depth map (left) and snow-on and snow-off topographic profiles (right). (A) Snow-on topographic profile; (B) snow-off topographic profile; (C) snow-depth profile derived from (A) and (B).



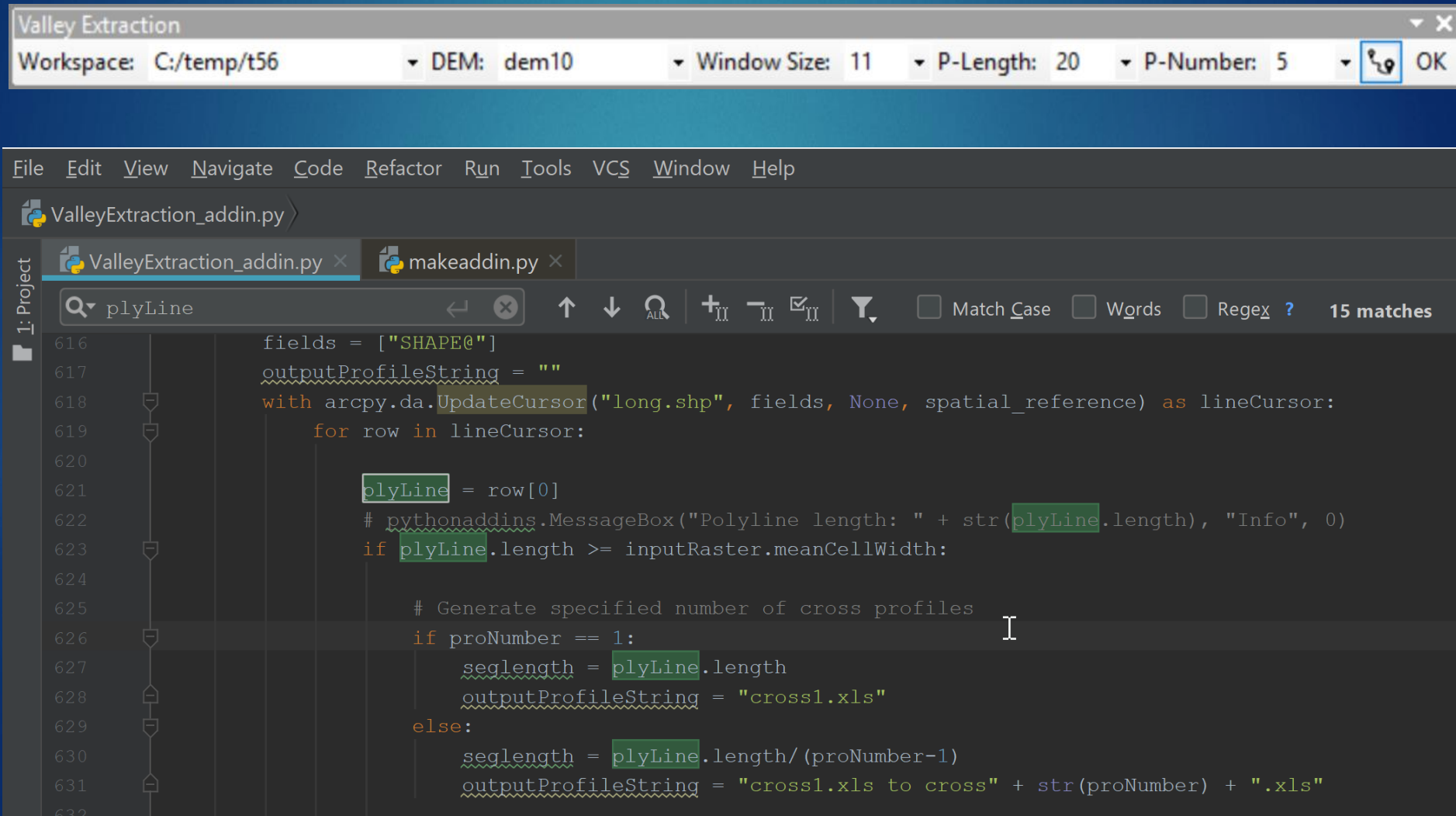
Demo:

Semi-automated extraction of valleys and Valley profiles from digital terrain models



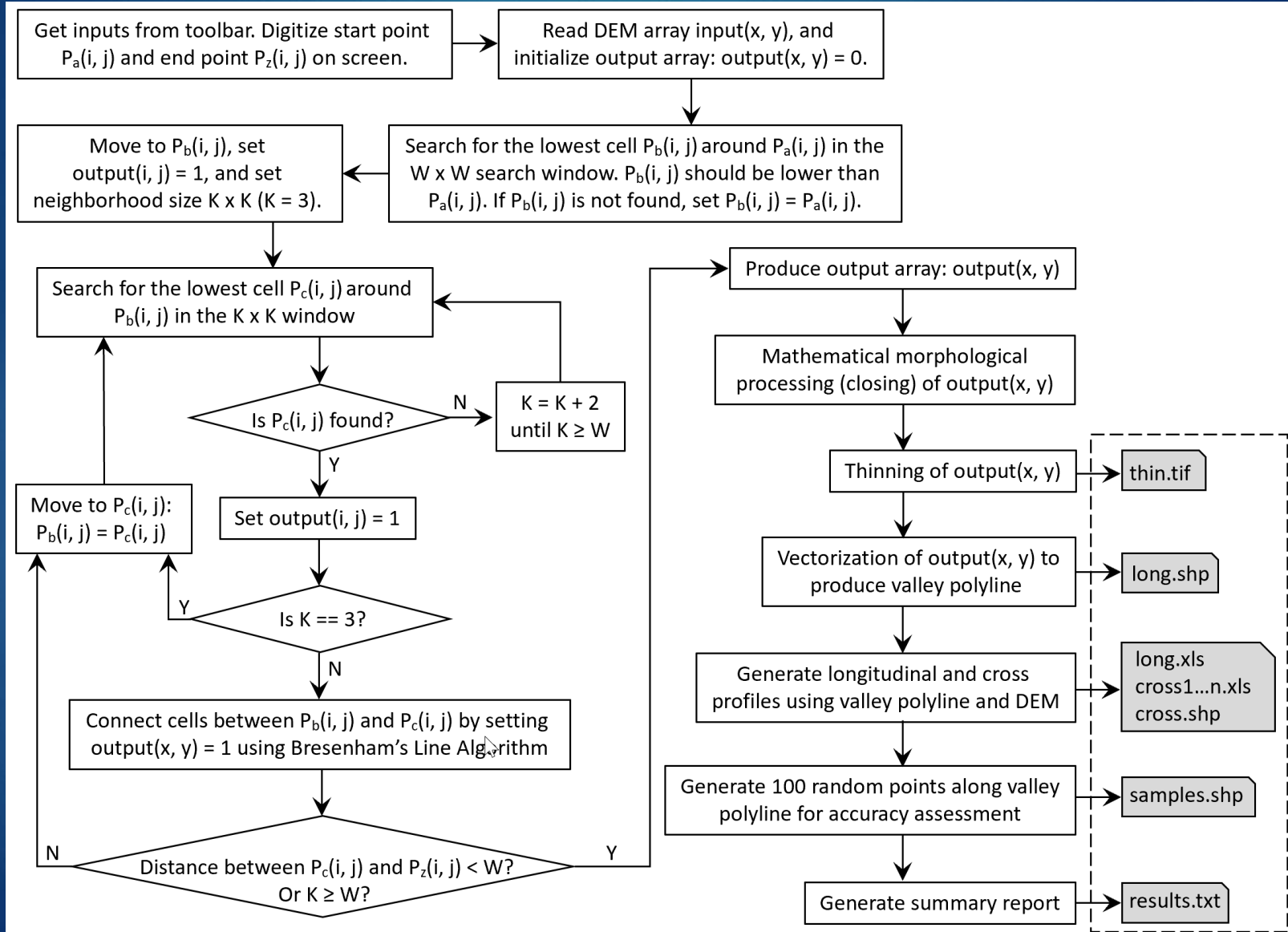
Demo:

Python Add-in Toolbar



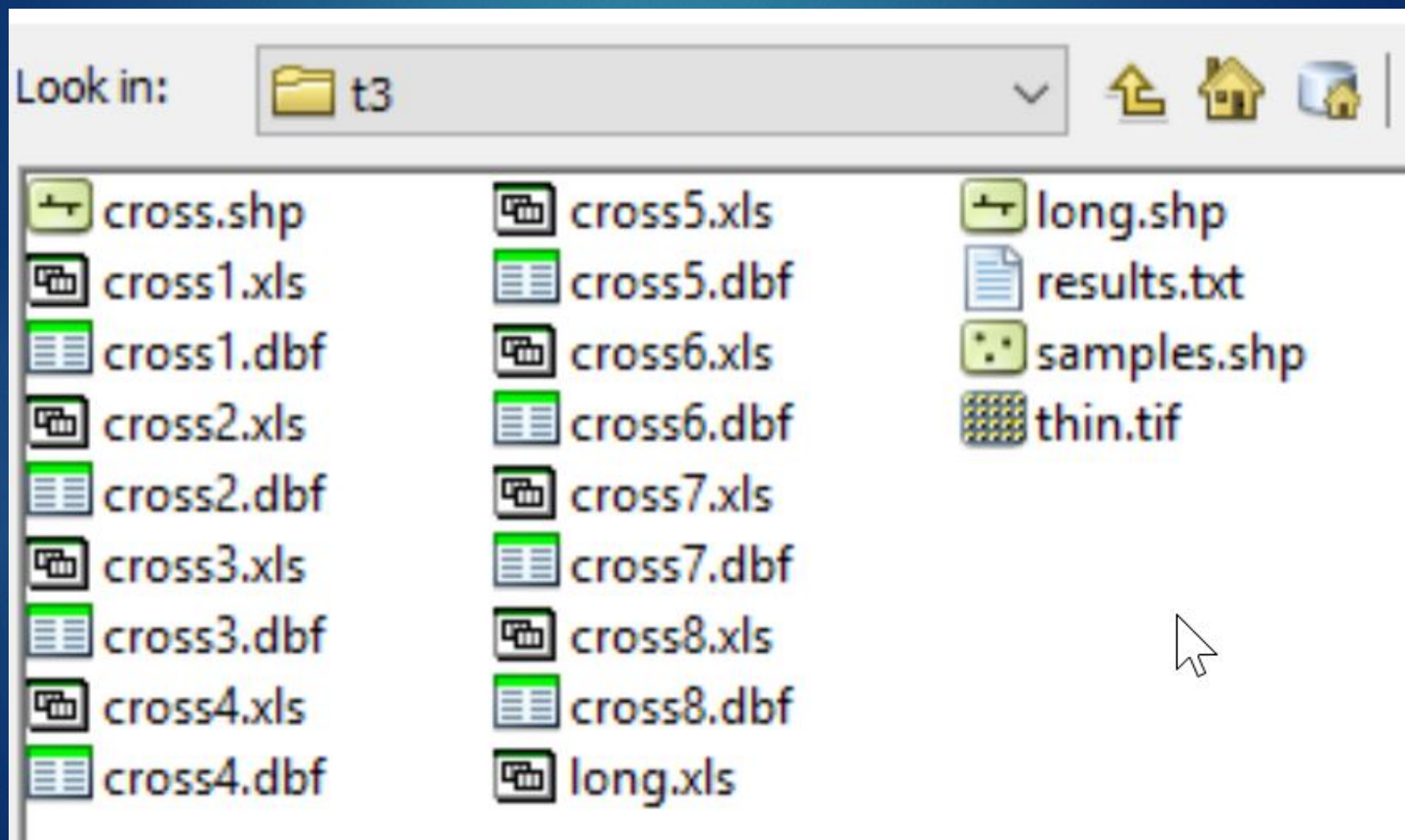
Demo:

Flowchart



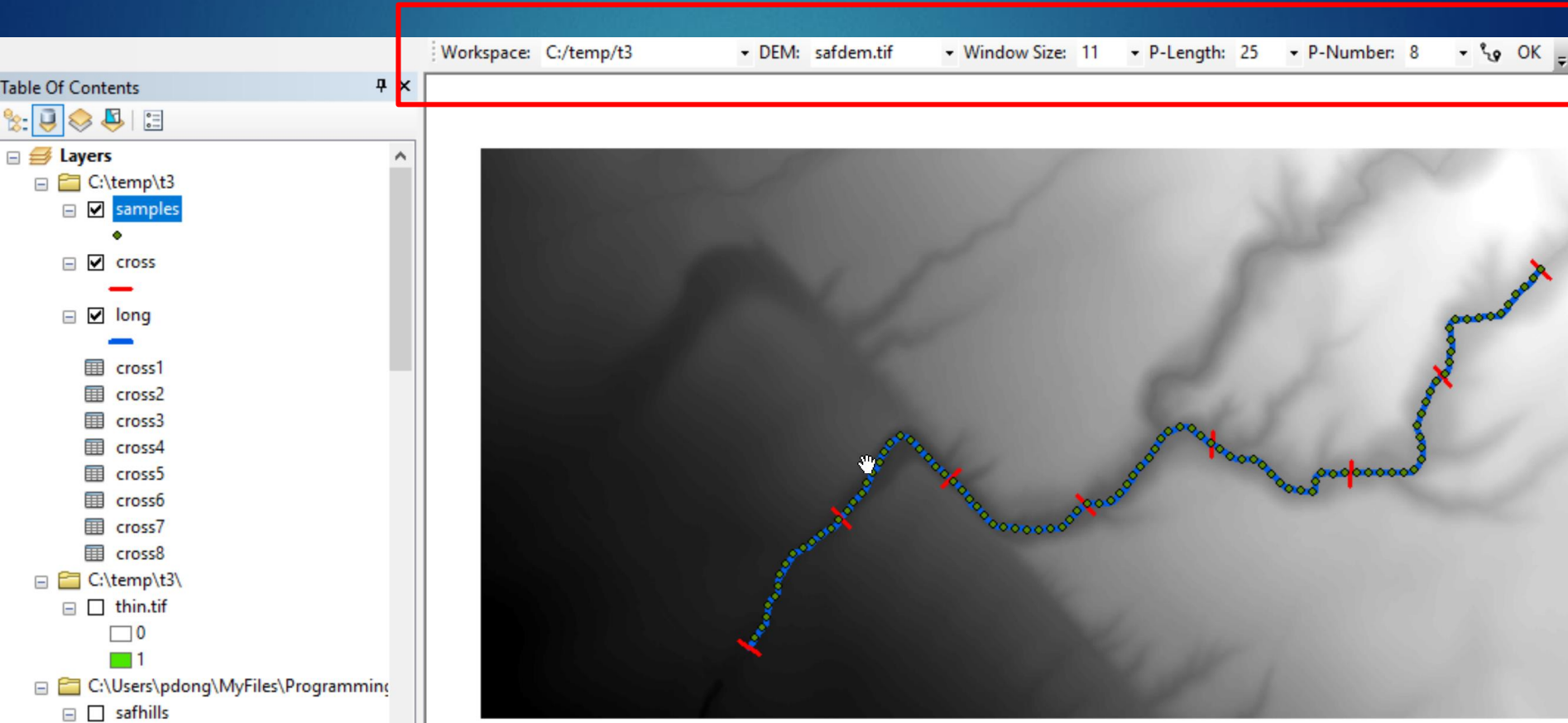
Demo:

Output data



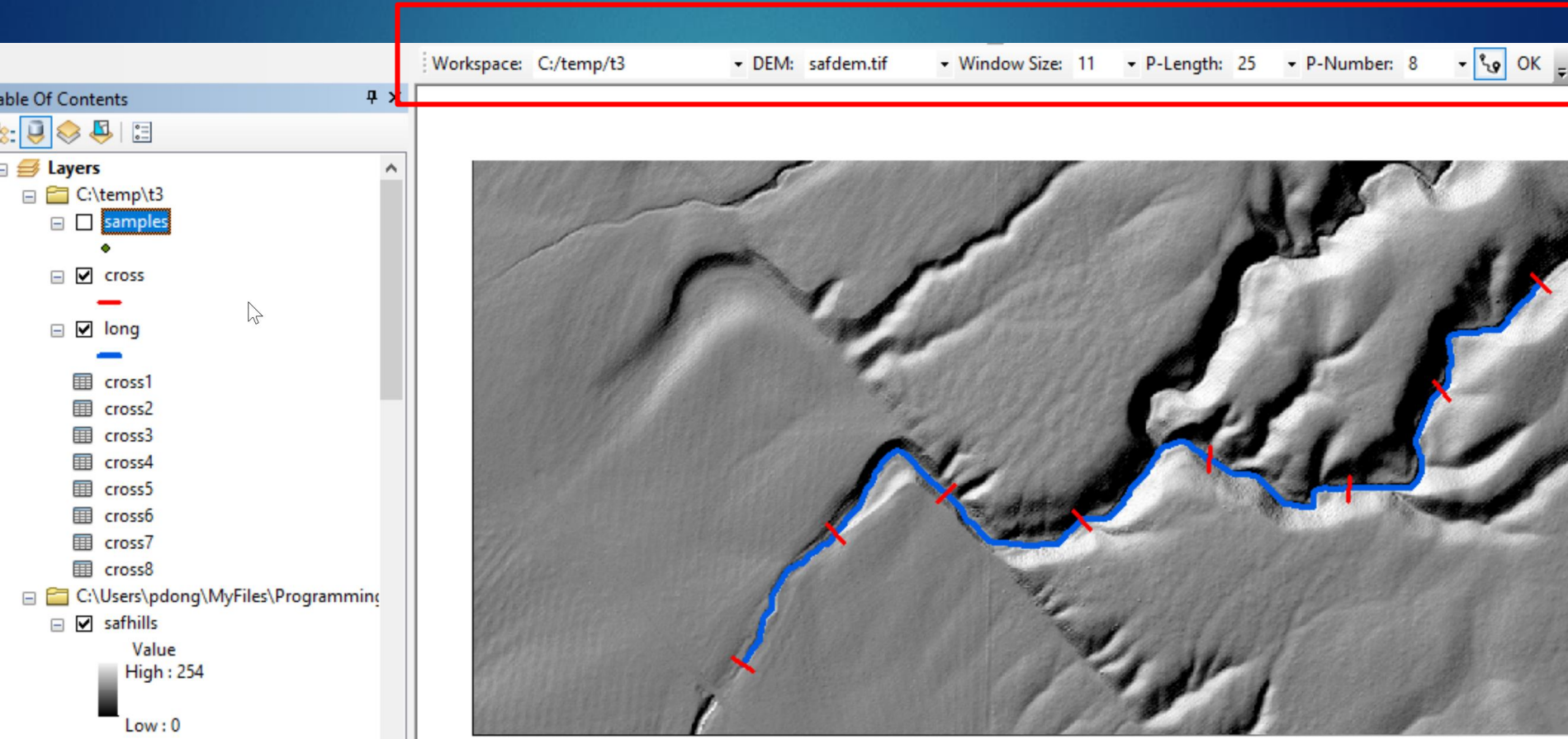
Demo:

Python Add-in Toolbar



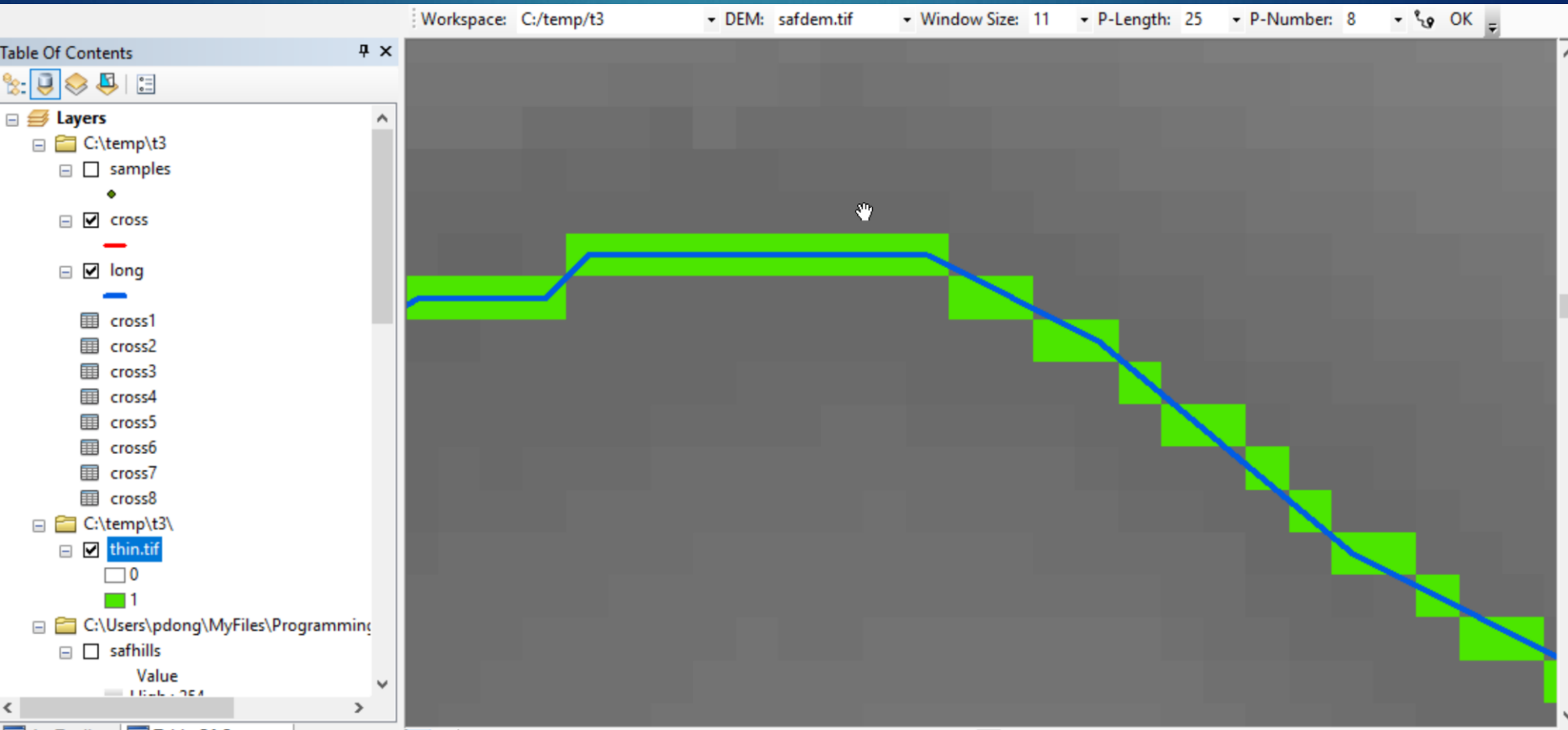
Demo:

Python Add-in Toolbar



Demo:

Python Add-in Toolbar



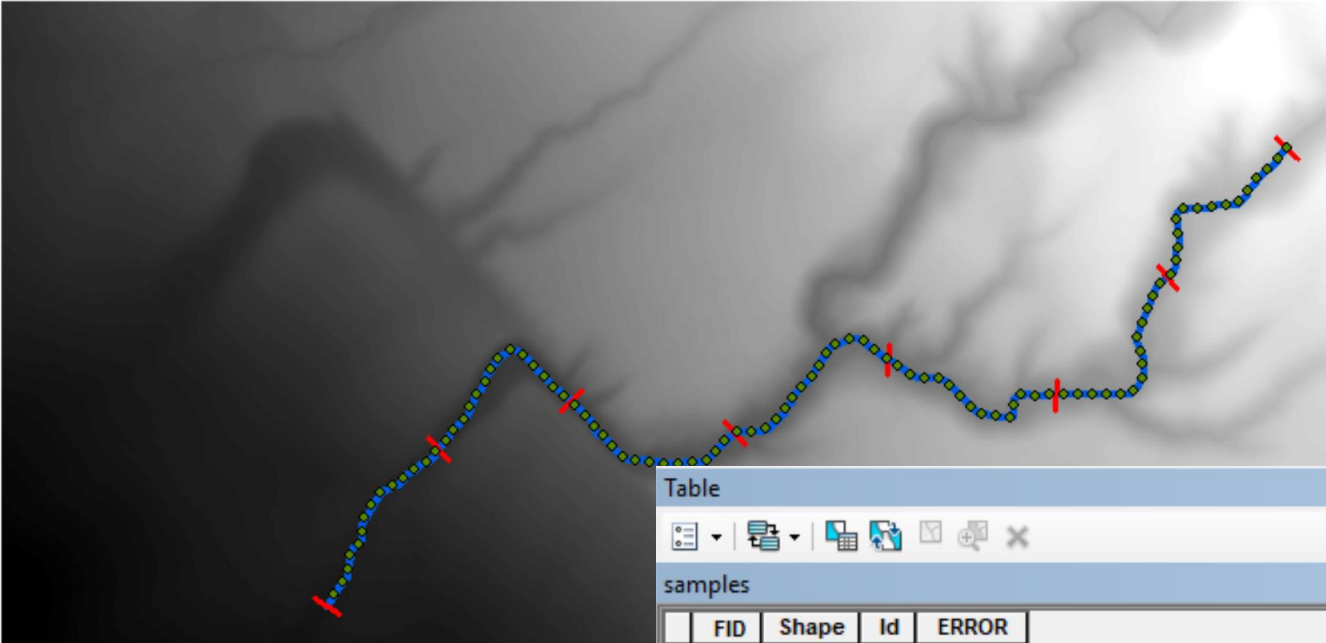
Demo:

Python Add-in Toolbar

Workspace: C:/temp/t3 DEM: safdem.tif Window Size: 11 P-Length: 25 P-Number: 8 OK

Table Of Contents

- Layers
 - C:\temp\t3
 - ☒ samples
 - ☒ cross
 - ☒ long
 - cross1
 - cross2
 - cross3
 - cross4
 - cross5
 - cross6
 - cross7
 - cross8
 - C:\temp\t3\
 - ☐ thin.tif
 - 0
 - 1



Table

samples

	FID	Shape	Id	ERROR
	30	Point	0	0.96709
	31	Point	0	0.967087
	32	Point	0	0.967134
	33	Point	0	0.967146
	34	Point	0	0.005179
	35	Point	0	0.96709
	36	Point	0	0.967147
	37	Point	0	0.967142
	38	Point	0	0.005204
	39	Point	0	1.929071

1 (0 out of 100 Selected)

samples

Demo:

Summary file

2018-11-03 10:22:52.329000

Input DEM: C:\Users\pdong\MyFiles\Programming\ValleyProfile\Data\AOI2\dem10

DEM resolution: 1.0 m

Output folder: C:/temp/t57

Output valley raster: thin.tif

Output valley shapefile: long.shp

Output Excel file for longitudinal profile: long.xls

Output shapefile for cross profile(s): cross.shp

Output Excel file(s) for cross profile(s): cross1.xls to cross5.xls

Output shapefile for random samples: samples.shp

Mean Absolute Error (MAE) of long.shp: 0.5047 m

Root Mean Square Error (RMSE) of long.shp: 0.5302 m

NSSDA accuracy of long.shp: 0.9177 m

Processing time: 27.44 second(s).