The Gridding Size Effects on Exposing Highway Profile

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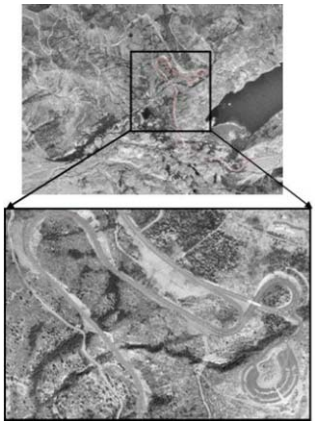
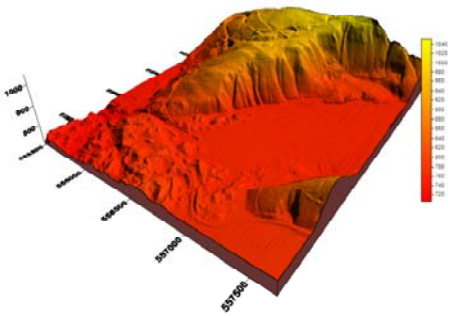
The Goal of The Study

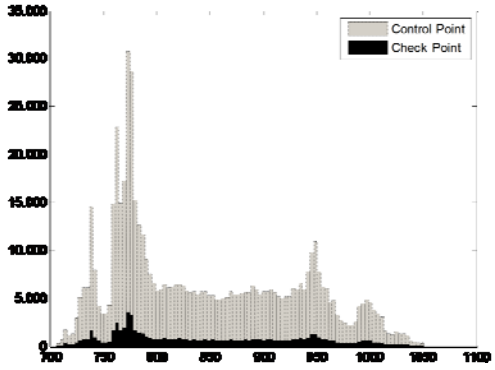
- Different gridding size effect
- Different interpolation methods effect
- To expose the vertical highway geometry based on manually obtained horizontal geometry

Study Environment and Data





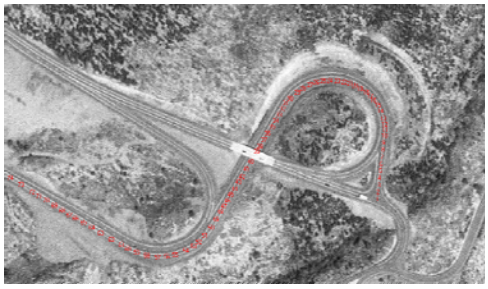
Case Study Data Features

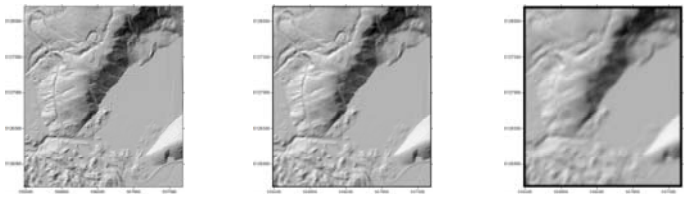


- The maximum elevation is 1050.40 m,
- Minimum elevation is 705.90 m,
- Mean elevation 844.77 m and
- Median elevation is 823.72 m.

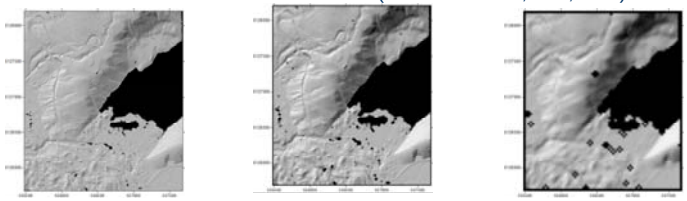
The elevation distribution histograms

Generating Horizontal Geometry and Adequate DEMs

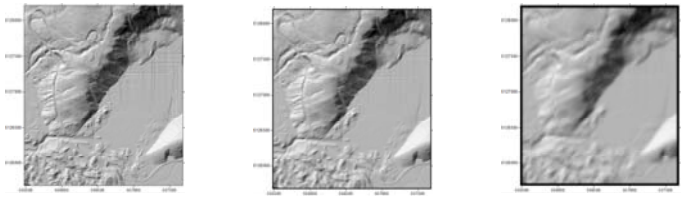




- **Inverse Distance to a Power** (Grid Interval: 1m, 10m, 30 m)

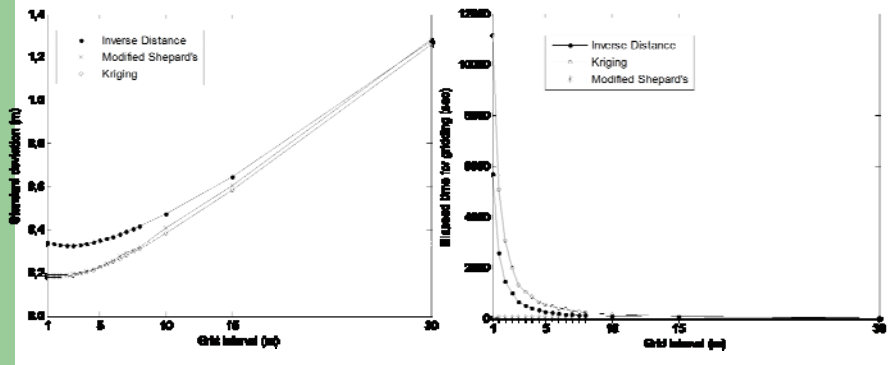


- **Modified Shepard's Method** (Grid Interval: 1m, 10m, 30 m)



- **Kriging Method** (Grid Interval: 1m, 10m, 30 m)

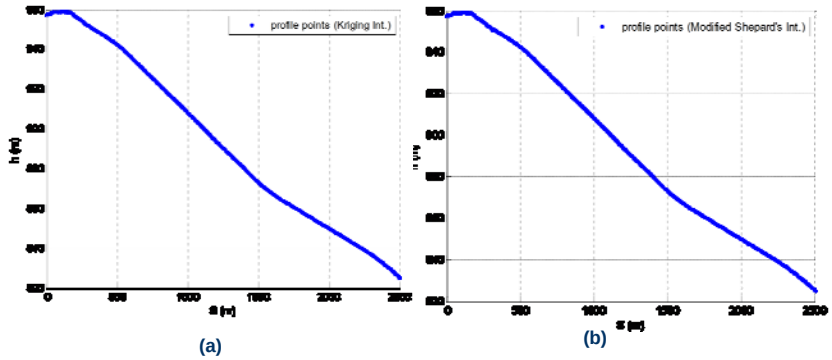
	Inverse Distance				Kriging				Modified Shepard's			
Grid (m)	Min. (m)	Max. (m)	Mean (m)	Standart Deviation (m)	Min. (m)	Max. (m)	Mean (m)	Standart Deviation (m)	Min. (m)	Max. (m)	Mean (m)	Standart Deviation (m)
1	-11.9717	3.6458	-0.0103	0.3397	-12.0404	3.8484	-0.0007	0.1774	-12.0069	5.2981	-0.0003	0.1921
1.5	-12.0060	3.6840	-0.0101	0.3339	-12.0648	3.8490	-0.0007	0.1785	-12.0401	5.0704	-0.0003	0.1913
2	-12.0103	3.6588	-0.0096	0.3277	-12.0571	3.8494	-0.0006	0.1800	-12.0480	5.2303	-0.0003	0.1907
2.5	-12.0034	3.7133	-0.0091	0.3243	-12.0461	3.8460	-0.0003	0.1829	-12.0208	5.0193	-0.0001	0.1914
3	-12.1342	3.6824	-0.0091	0.3243	-12.0587	3.8358	-0.0001	0.1876	-12.0646	4.6857	-0.0002	0.1952
3.5	-11.9722	3.7200	-0.0089	0.3290	-12.0759	3.8469	0.0000	0.1940	-12.0214	4.7681	-0.0002	0.1999
4	-11.9923	3.6609	-0.0083	0.3342	-11.9244	3.8603	0.0002	0.2025	-11.9350	3.8737	-0.0002	0.2069
4.5	-11.9656	3.6630	-0.0084	0.3409	-11.9379	3.8612	0.0002	0.2118	-11.9059	3.8228	-0.0005	0.2166
5	-11.9770	3.8139	-0.0088	0.3483	-12.0427	3.8788	0.0004	0.2229	-12.0960	7.0313	-0.0004	0.2288
5.5	-11.9998	3.6883	-0.0072	0.3575	-12.0680	3.8479	0.0018	0.2366	-12.0409	4.9440	0.0007	0.2424
6	-12.1302	4.4253	-0.0071	0.3683	-12.1526	3.8488	0.0018	0.2498	-12.1622	6.3446	0.0007	0.2548
6.5	-12.2083	4.7830	-0.0069	0.3800	-12.2353	3.8511	0.0020	0.2651	-12.2458	7.7260	0.0007	0.2747
7	-11.8693	4.7243	-0.0073	0.3916	-11.7448	3.9959	0.0021	0.2796	-11.7555	13.8113	0.0004	0.2907
7.5	-12.3235	5.1504	-0.0066	0.4044	-12.2335	3.8195	0.0031	0.2950	-12.2416	8.7254	0.0009	0.3035
8	-12.3237	4.1002	-0.0045	0.4151	-12.4083	3.9459	0.0044	0.3101	-12.4198	6.4477	0.0020	0.3185
10	-12.1825	5.5304	-0.0037	0.4721	-12.5662	3.8802	0.0064	0.3823	-12.7322	22.2406	0.0036	0.4053
15	-12.0709	7.4632	0.0065	0.6445	-12.3743	5.7979	0.0188	0.5852	-12.3915	6.4877	0.0152	0.6053
30	-11.8038	10.7631	0.0685	1.2739	-11.7911	10.6211	0.0907	1.2578	-11.8140	14.6537	0.0902	1.2854



(a) (b)

(a) Change of Standard deviations by grid intervals, **(b)** Elapsed times for gridding process based on grid intervals

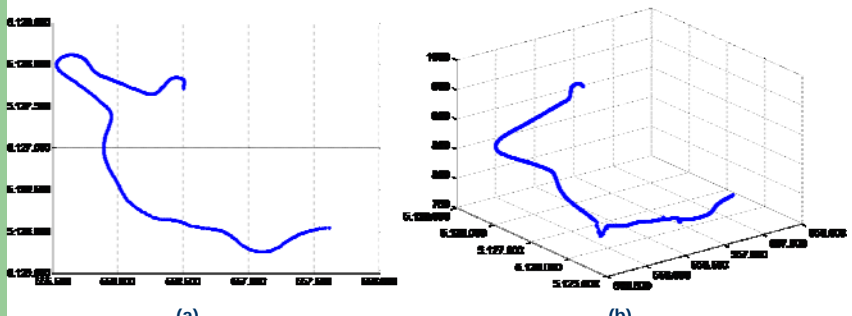
Profile Extraction



(a) (b)

(a) Highway profile obtained by Kriging Int. **(b)** Highway profile obtained by Modified Shepard's Int.

RESULTS and CONCLUSION



(a) (b)

(a) 2 dimensional view **(b)** 3 dimensional view