ÇEV 361
Coğrafi Bilgi Sistemleri ve Uzaktan Algılama

Coğrafi Analizler

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Coğrafi Analizler

Yüzey Analizleri

- Yüzey Modelleri
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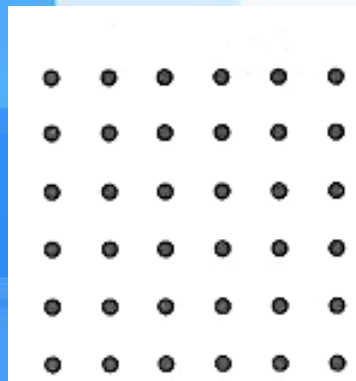
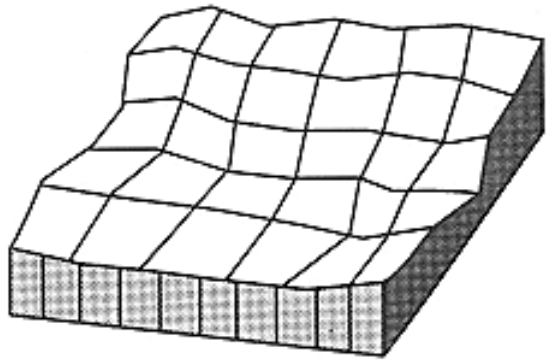
- Çakıştırma Analizi
- Tematik Haritalama
- Enterpolasyon

Yüzey Modelleri

Düzenli Topolojik Modelleme

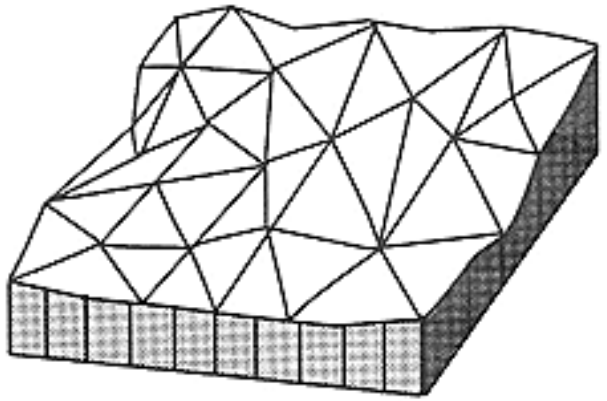
Sayısal Yükseklik Modeli
Digital Elevation Model (DEM)





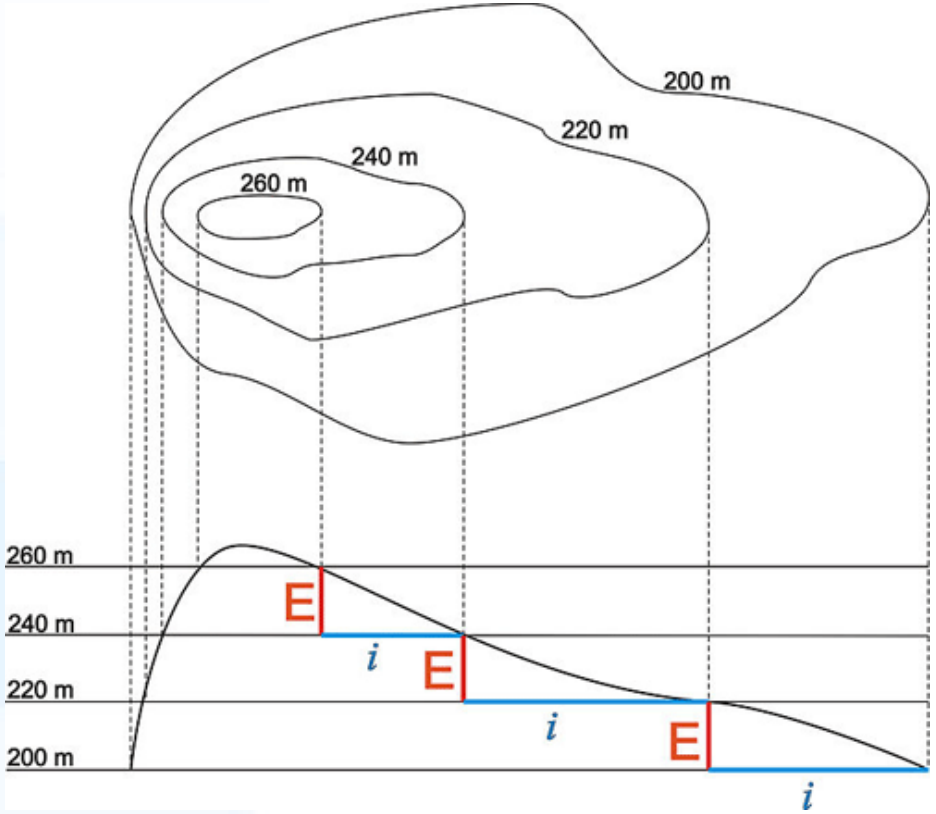
Düzensiz Topolojik Modelleme

Düzensiz Üçgen Ağ
Triangulated Irregular network (TIN)

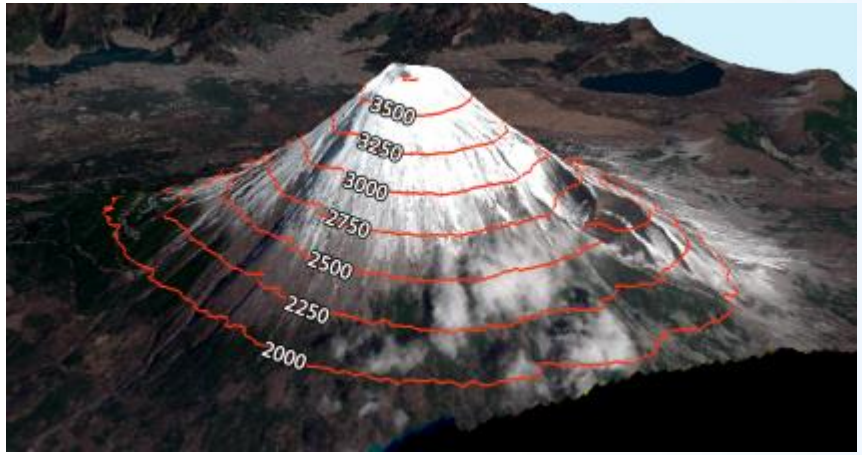


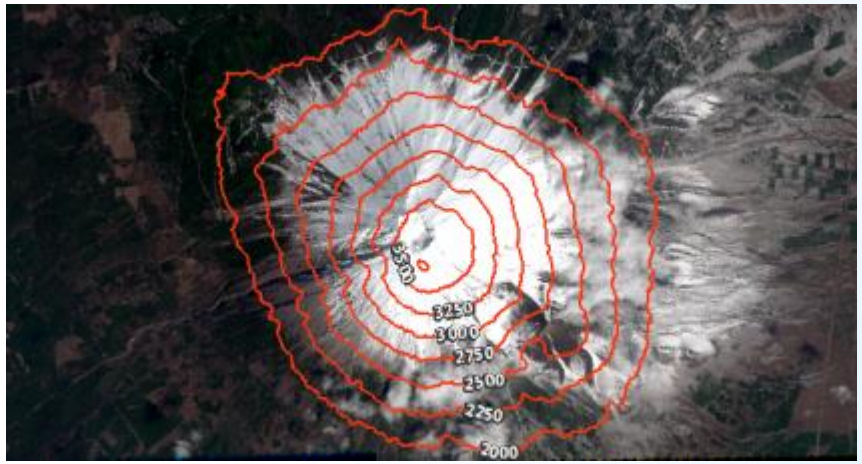
Yüzey Modelleri

Eşyükselti Eğrileri



https://www.gislounge.com/gis-dictionary-letter-c/



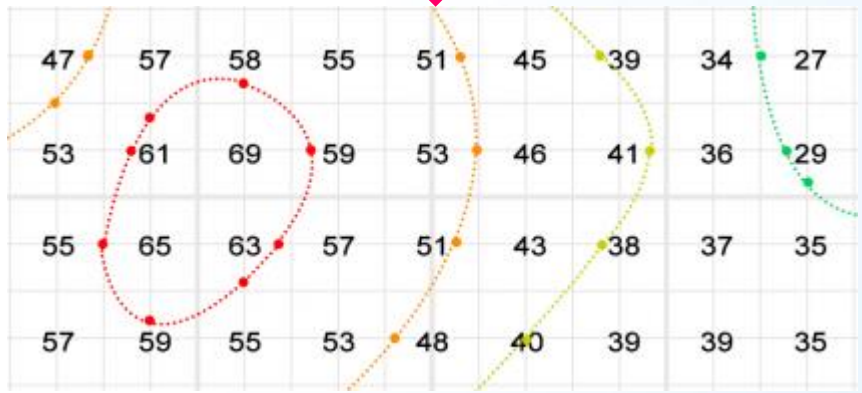


https://gisgeography.com/contour-lines-topographic-map/

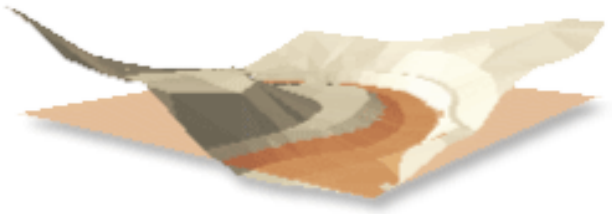
Eşyükselti Eğrileri - Örnek Uygulama

47	57	58	55	51	45	39	34	27
53	61	69	59	53	46	41	36	29
55	65	63	57	51	43	38	37	39
57	59	55	53	48	40	39	39	35

30, 40, 50 ve 60 için noktalar belirlenir ve çizgiler çizilir.



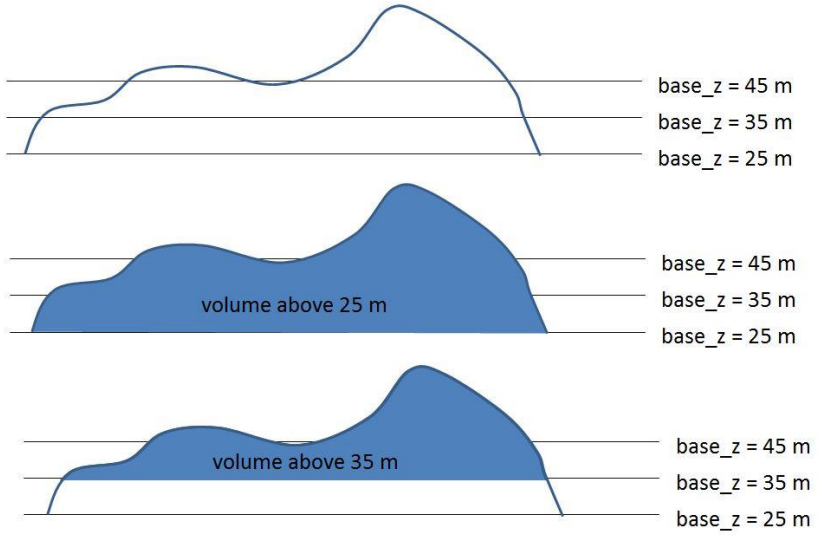
Hacim Hesaplaması



Output Format

Dataset	Plane Height	Reference	Z Factor	Area 2D	Area 3D	Volume
D:\temp\GP\dtm_tin	100.00	ABOVE	1.00	15984467.82	16354331.40	1886012931.07

http://resources.esri.com/help/9.3/arcgisdesktop/com/gp_toolref/3d_analyst_tools/surface_volume_3d_analyst_.htm



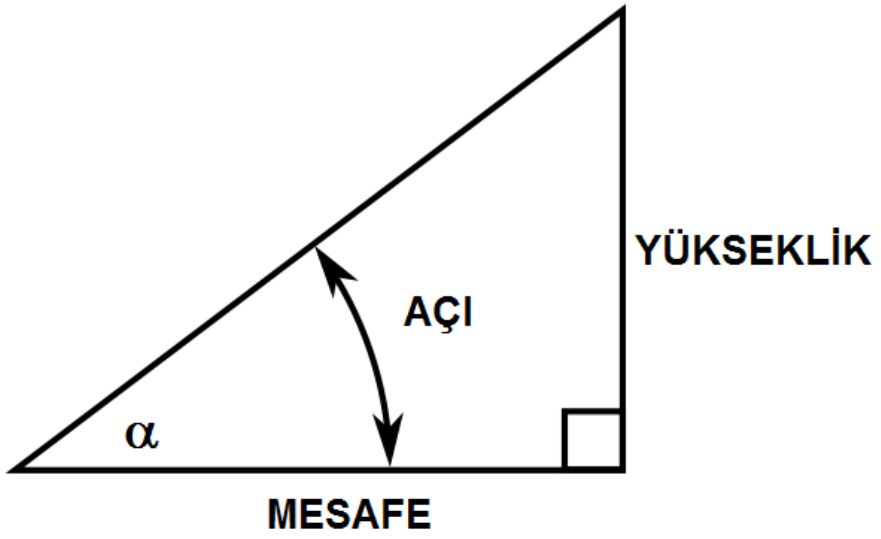
https://gis.stackexchange.com/questions/91131/how-to-make-polygon-volume-in-tin-surface

Eğim Analizi

- Yüzeyin yatay ile yaptığı açının derece veya yüzde cinsinden ifadesi.

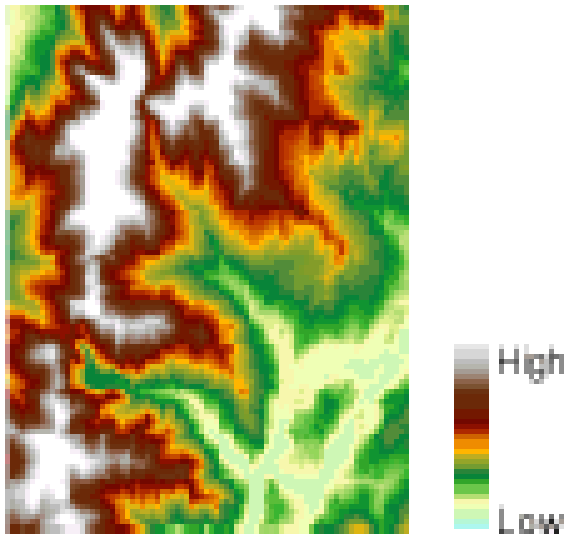
$$Eğim = \tan(\alpha) = \frac{Yükseklik}{Mesafe}$$

$$Eğim\ (\%) = \tan(\alpha) \times 100 = \frac{Yükseklik}{Mesafe} \times 100$$

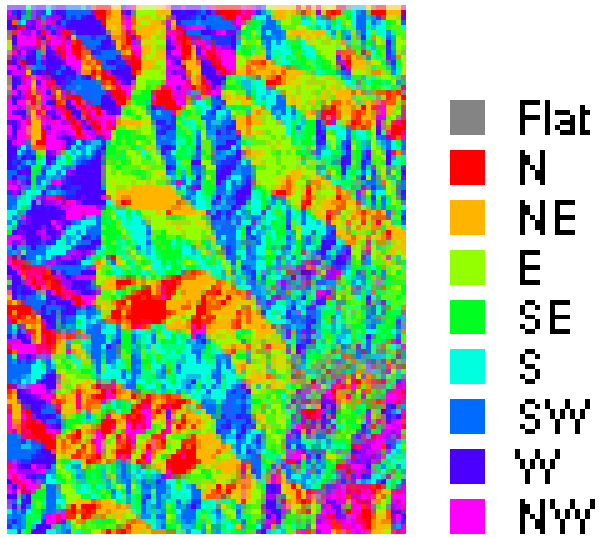


Bakı Analizi

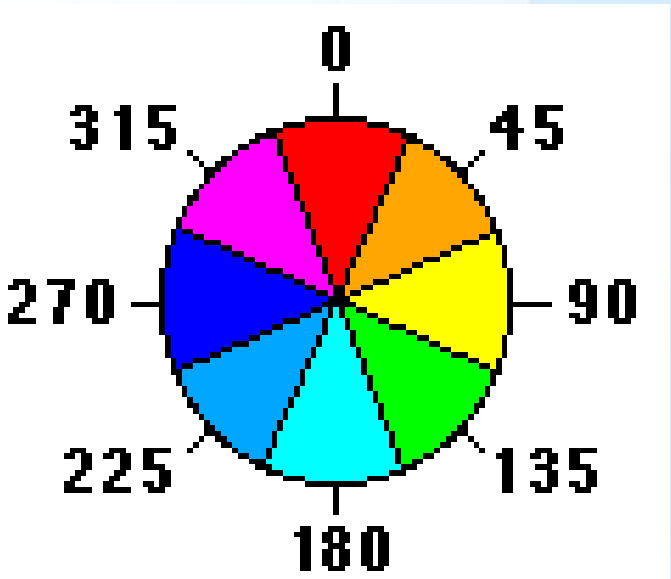
- Bir yüzeyin bakış yönünün analizidir.



Input elevation raster

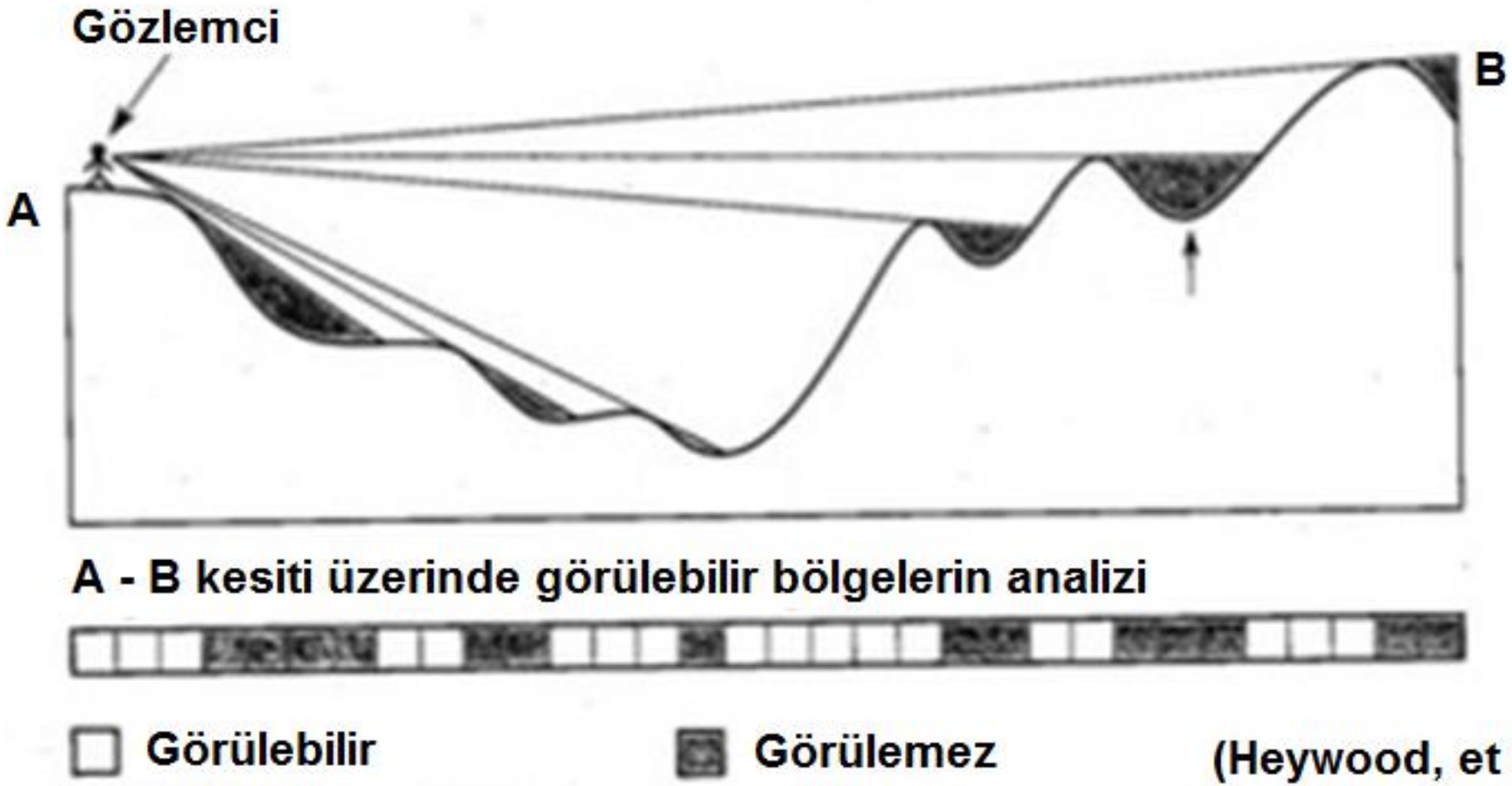


Output aspect raster



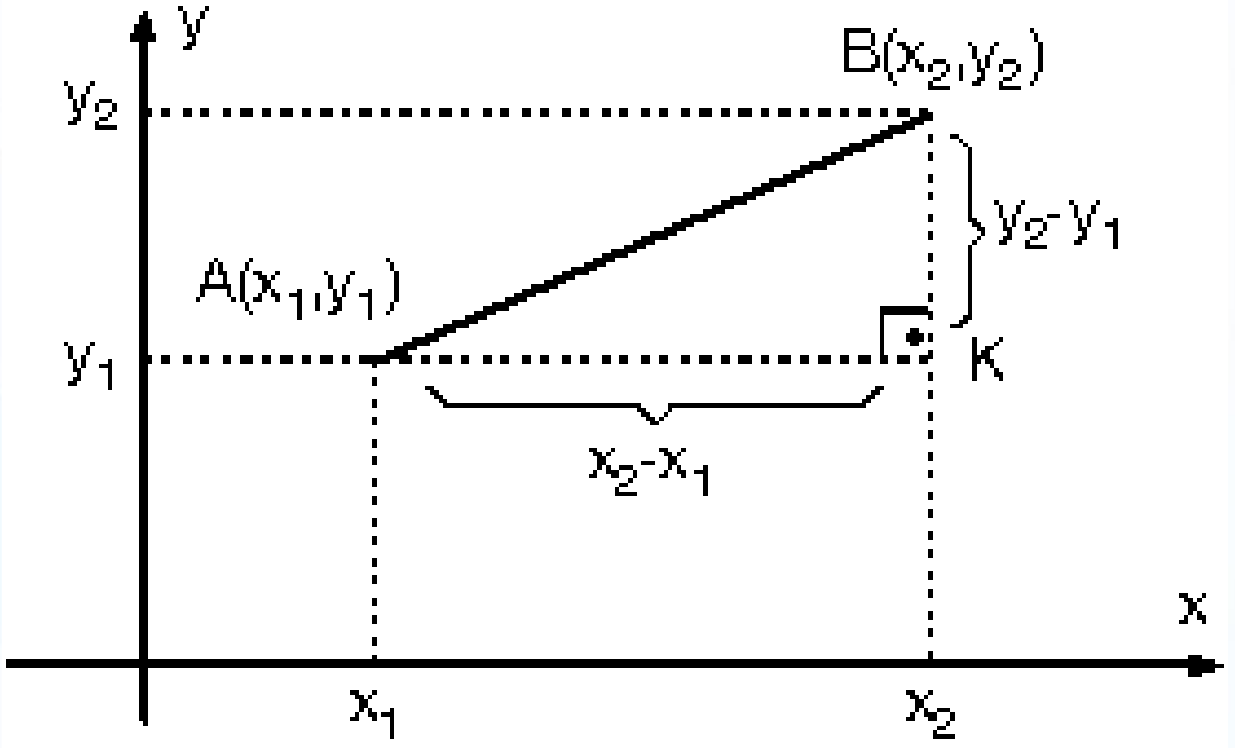
https://desktop.arcgis.com/en/arcmap/10.3/tools/spatial-analyst-toolbox/how-aspect-works.htm

Görülebilirlik Analizi



Mesafe Ölçümü

$$Mesafe = |AB| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



http://www.analitikgeometri.com/ders-1-noktanin-analitik-incelenmesi.html

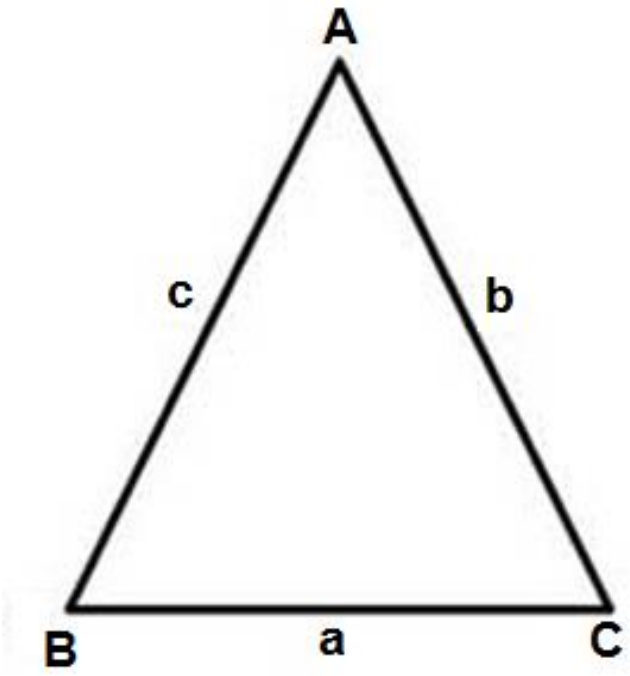
Mesafe Ölçümü

Şekil 8. Maksimum PM_{10} konsantrasyonunun oluştuğu noktaların Zonguldak HKİ'na olan mesafeleri.

Ö. Zeydan vd.: Hava Kalitesi Modellenmesinde Coğrafi Bilgi Sistemlerinin Kullanımı: Zonguldak Örneği

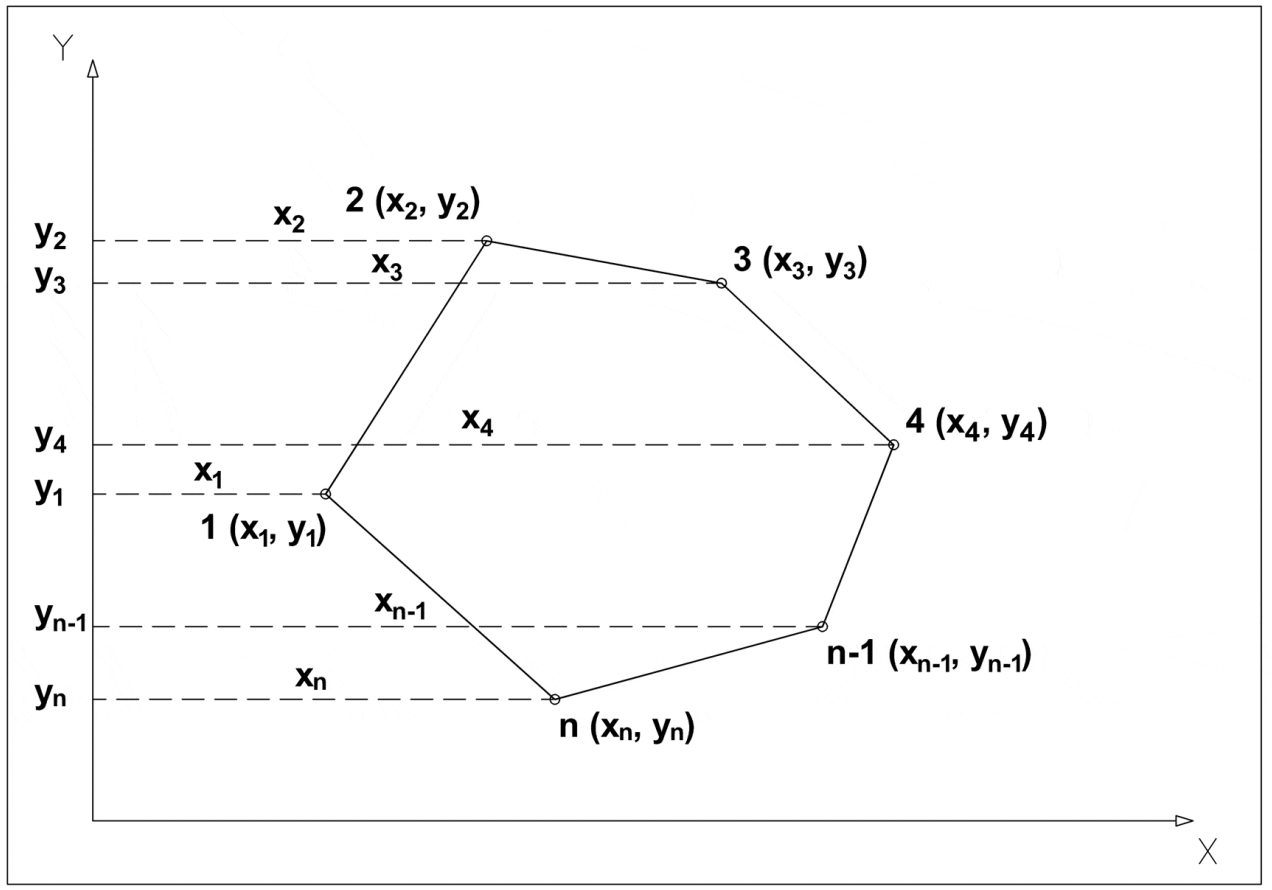
Alan Ölçümü

- Üçgende yarı çevre (s) ile alan hesaplama
- $s = \frac{a+b+c}{2}$
- $Alan = \sqrt{s \cdot (s-a) \cdot (s-b) \cdot (s-c)}$



Alan Ölçümü

- Gauss metodu ile alan hesaplama



https://www.thecivilengineer.org/education/calculation-examples/item/1319-calculation-example-three-point-resection

Alan Ölçümü (Gauss Metodu)

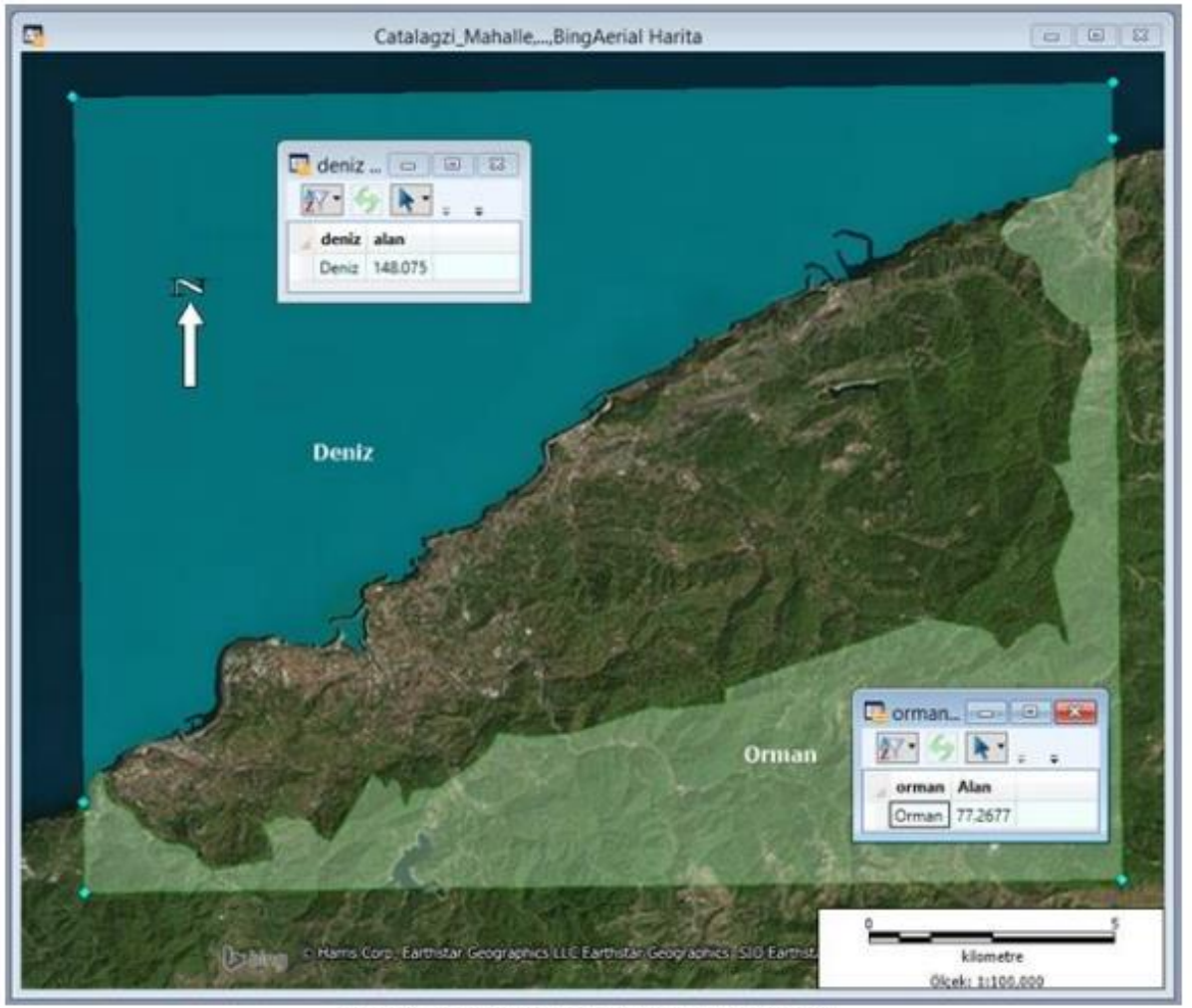
- Hatırlatma:
- $Yamuk\ alanı = \frac{(alt\ taban + üst\ taban) \cdot yükseklik}{2}$

$$2A = (x_3 + x_2)\cdot(y_2 - y_3) + (x_4 + x_3)\cdot(y_3 - y_4) + (x_{n-1} + x_4)\cdot(y_4 - y_{n-1}) + \\ +(x_n + x_{n-1})\cdot(y_{n-1} - y_n) - (x_1 + x_2)\cdot(y_2 - y_1) - (x_n + x_1)\cdot(y_1 - y_n)$$

$$2A = \sum_{i=1}^{n} [x_i \cdot (y_{i-1} - y_{i+1})] \qquad or \qquad 2A = \sum_{i=1}^{n} [y_i \cdot (x_{i-1} - x_{i+1})]$$

https://www.thecivilengineer.org/education/calculation-examples/item/1319-calculation-example-three-point-resection

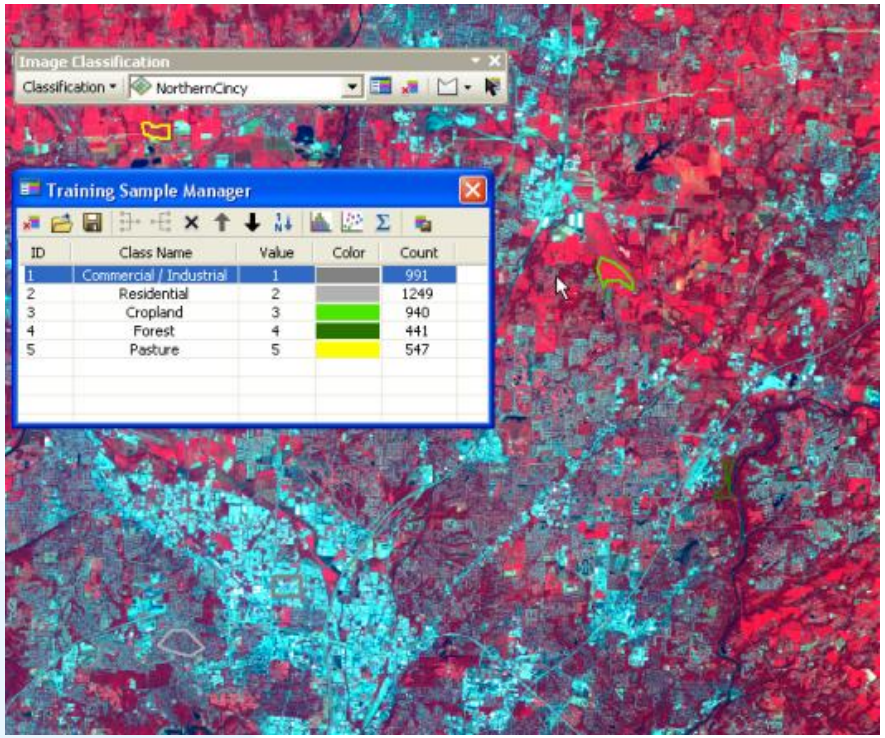
Alan Ölçümü

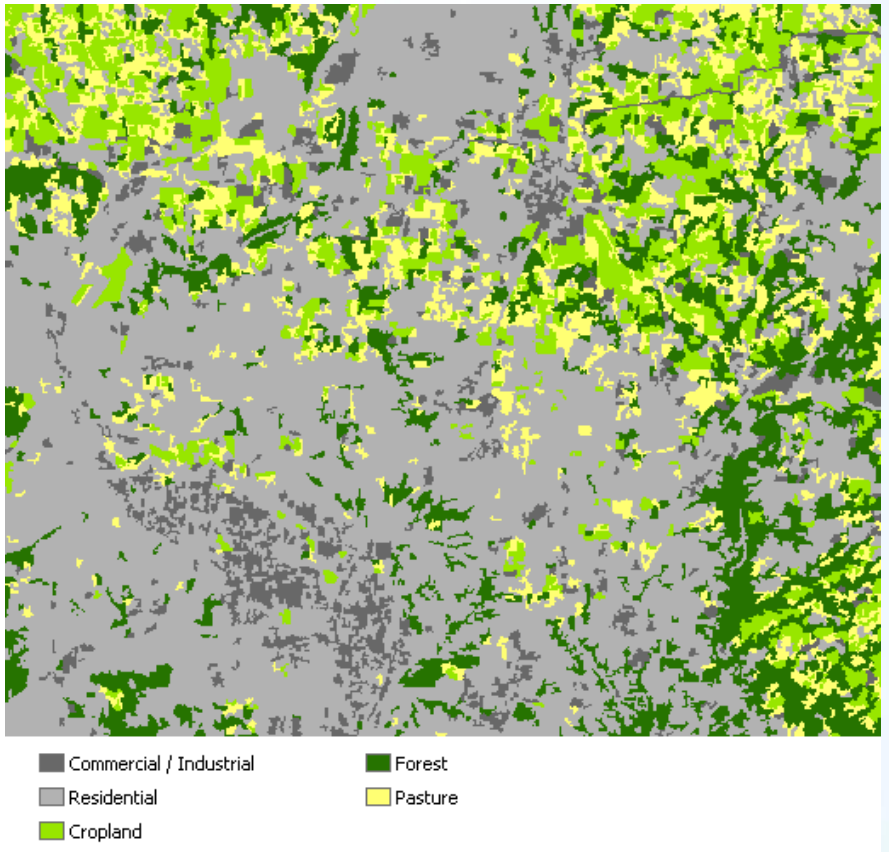


Şekil 5. Deniz ve orman alanlarının ölçülmesi.

Ö. Zeydan vd.: Hava Kalitesi Modellenmesinde Coğrafi Bilgi Sistemlerinin Kullanımı: Zonguldak Örneği

Sınıflama

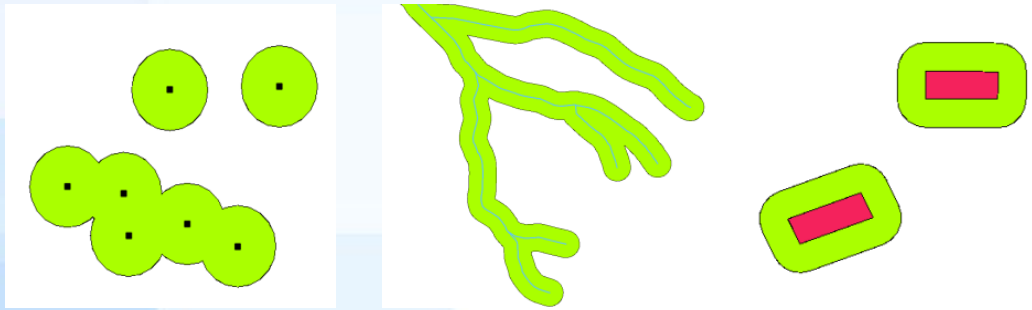




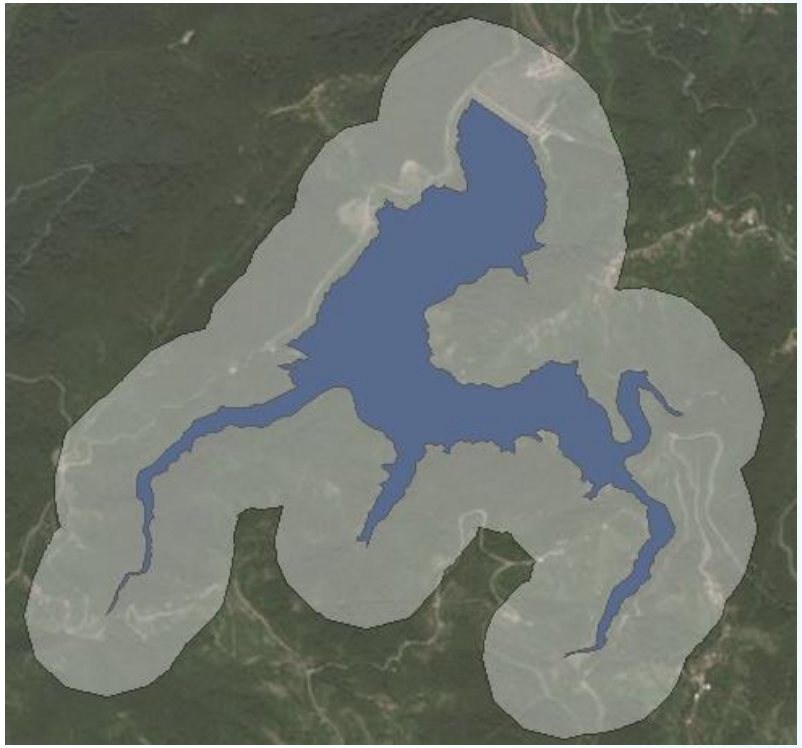
https://desktop.arcgis.com/en/arcmap/10.6/extensions/spatial-analyst/image-classification/what-is-image-classification-.htm

Tampon Bölge Analizi

- Bir nokta, çizgi veya poligona belirli mesafedeki bölgelerin belirlenmesi.



https://docs.qgis.org/2.14/en/docs/gentle_gis_introduction/vector_spatial_analysis_buffers.html



Ulutan Barajı, Zonguldak
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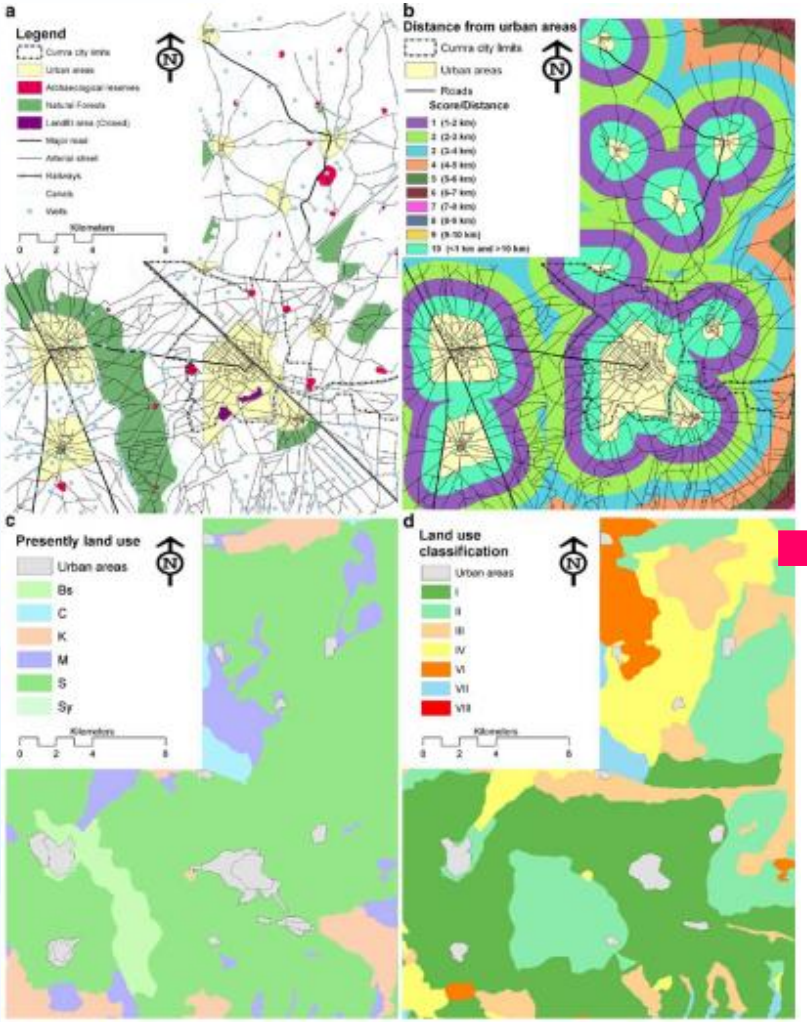
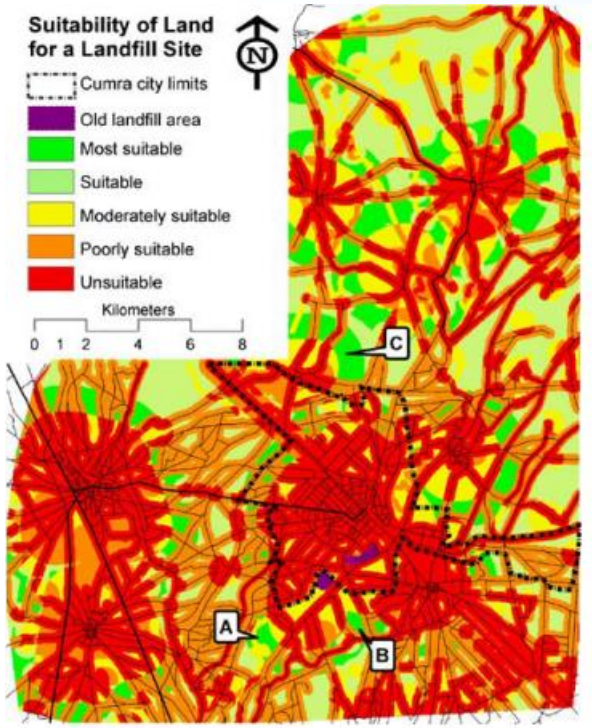
(ZBEÜ Çevre Müh. Mezunu)

Çakıştırma Analizi





Nas, B., Cay, T., Iscan, F., Berktay, A., Selection of MSW landfill site for Konya, Turkey using GIS and multi-criteria evaluation, Environ Monit Assess, 160, 491–500, 2010

Tematik Haritalama

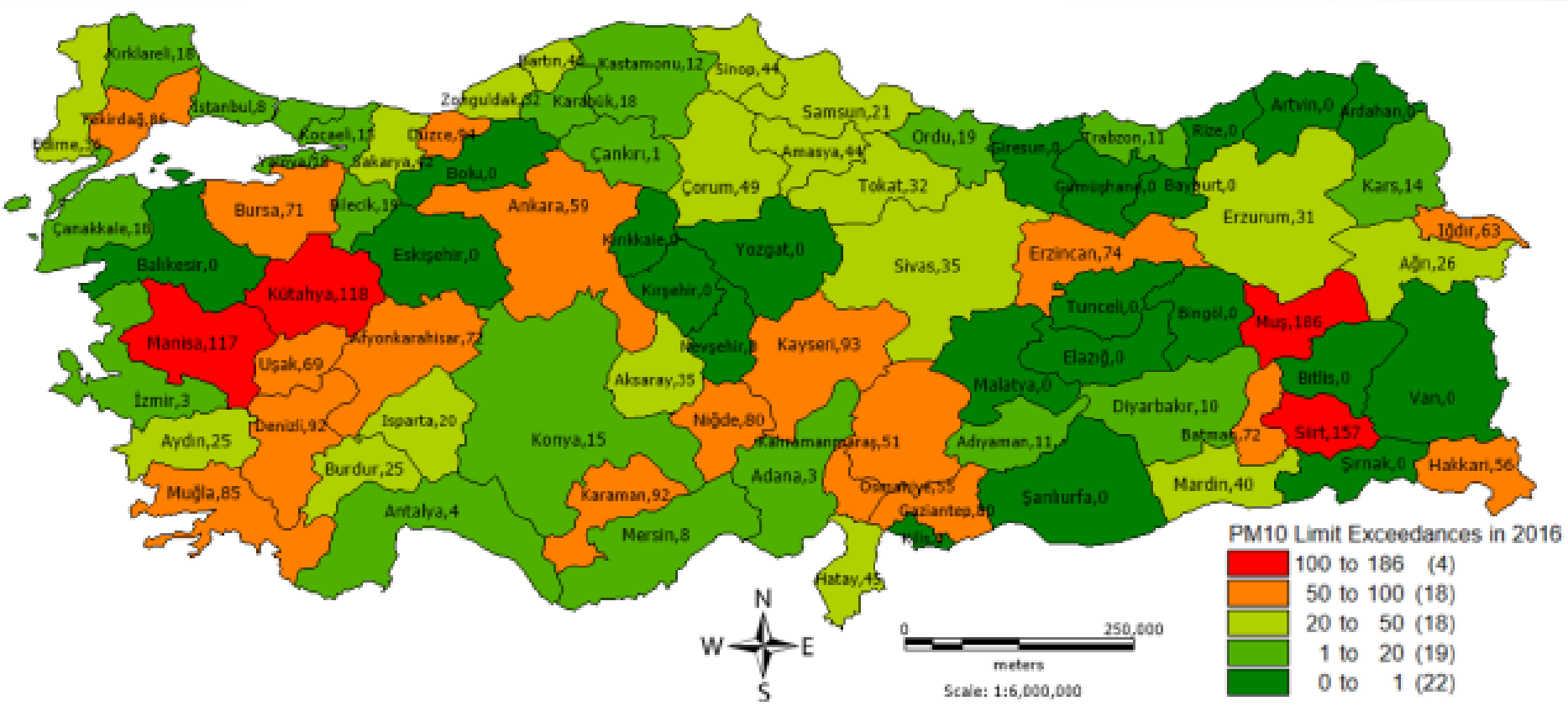
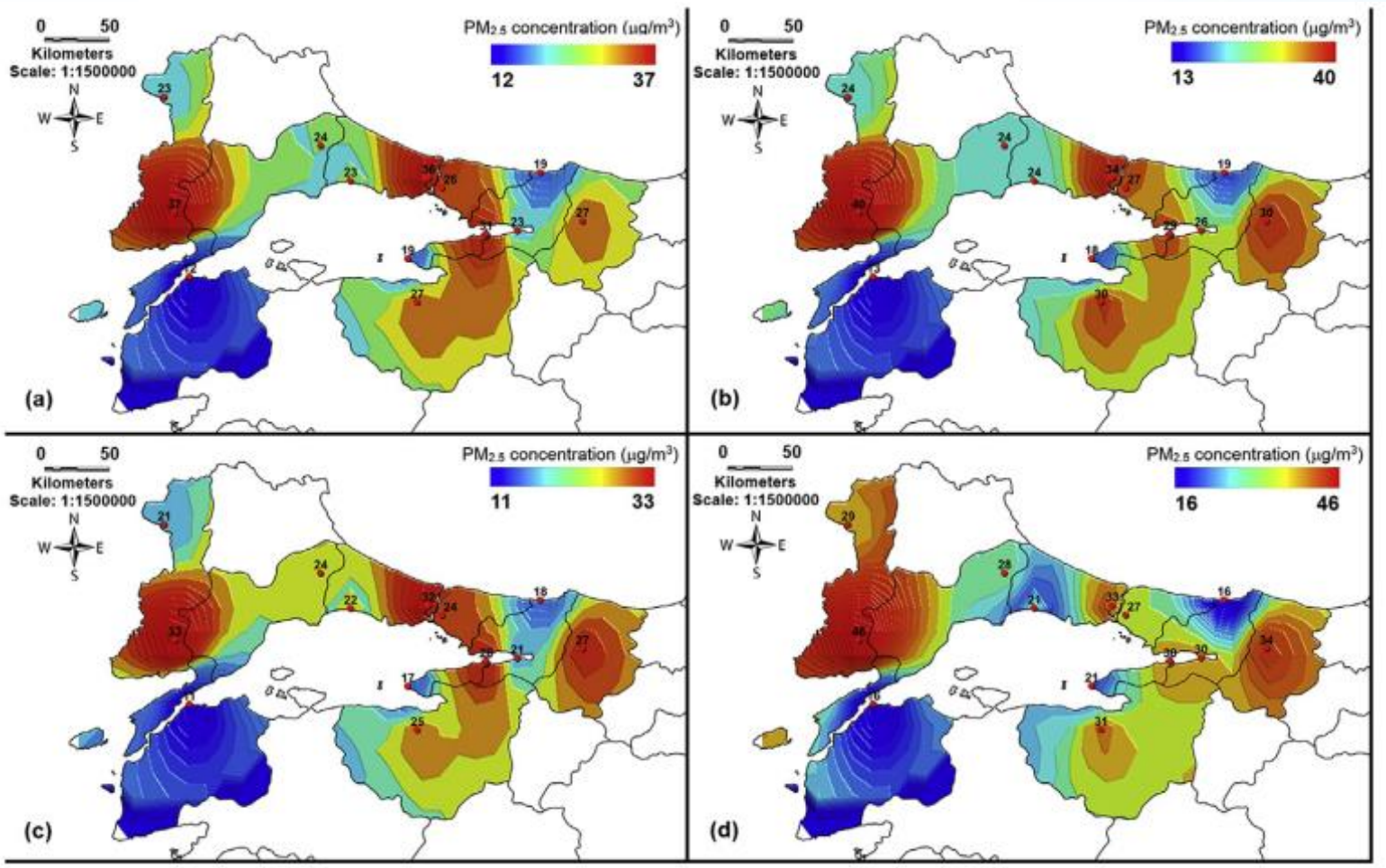


Figure 4. PM_{10} Limit Exceedances in 2016 (Limit: 80µg/m^3)

Zeydan, Ö., Karakaya, B. (2017) Assessment of PM_{10} Limit Exceedances in Turkish Cities, Journal of Young Scientist, 5, 115-120.

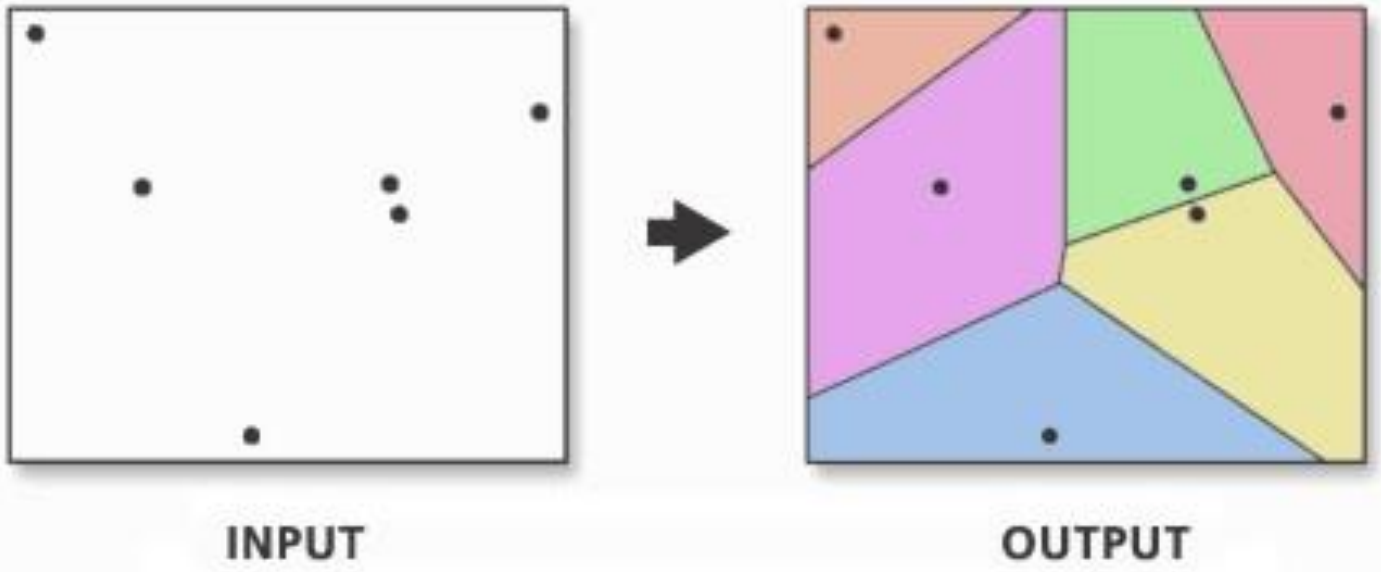
Enterpolasyon



Zeydan O., Wang Y., (2019) Using MODIS derived aerosol optical depth to estimate ground-level PM 2.5 concentrations over Turkey, Atmospheric Pollution Research, 10 (5), 1565-1576

Theissen Poligon

Voronoi diyagramı, bir düzlemin belirli bir nesne kümesinin her birine yakın bölgelere bölünmesidir.



https://desktop.arcgis.com/en/arcmap/latest/tools/analysis-toolbox/create-thiessen-polygons.htm

İleri Okuma

- Nas, B., Cay, T., Iscan, F., Berktay, A., Selection of MSW landfill site for Konya, Turkey using GIS and multi-criteria evaluation, Environ Monit Assess, 160, 491–500, 2010 Bağlantı
- Tas, E ., (2018), Coğrafi Bilgi Sistemleri Teknikleri Kullanılarak Taşkın Risk Potansiyelinin Değerlendirilmesi: Afyonkarahisar Çay Deresi Havzası, İklim Değişikliği ve Çevre, 3, (1) 68–74. Bağlantı
- Zeydan, Ö., Karakaya, B. (2017) Assessment of PM_{10} Limit Exceedances in Turkish Cities, Journal of Young Scientist, 5, 115-120. Bağlantı
- Zeydan Ö, Yıldırım Y, Karademir A, Durmuşoğlu E, *Hava Kalitesi Modellenmesinde Coğrafi Bilgi Sistemlerinin Kullanımı: Zonguldak Örneği*, 5. UZAKTAN ALGILAMA-CBS SEMPOZYUMU (UZAL-CBS 2014) 14-17 Ekim 2014, İstanbul Bağlantı