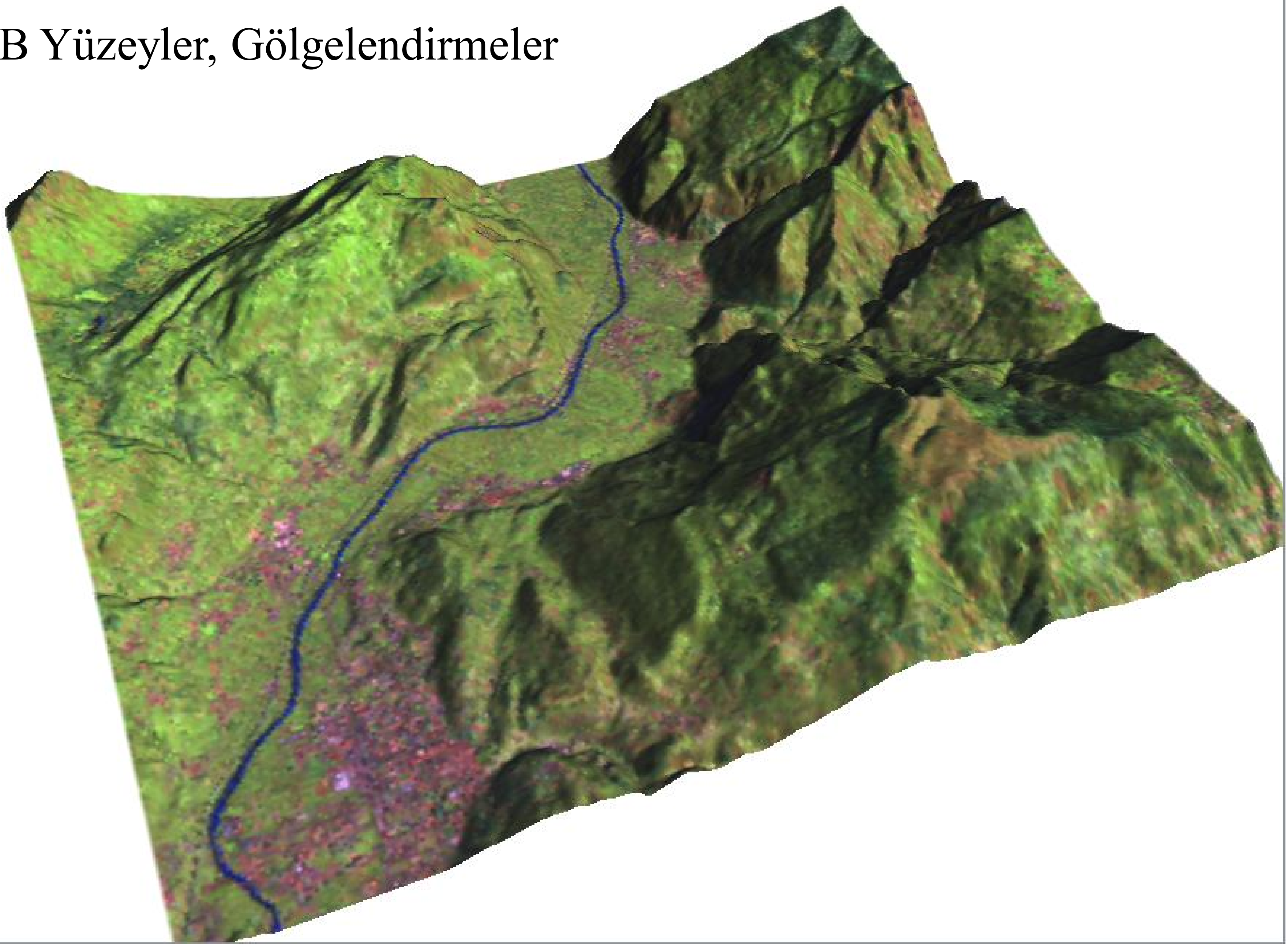
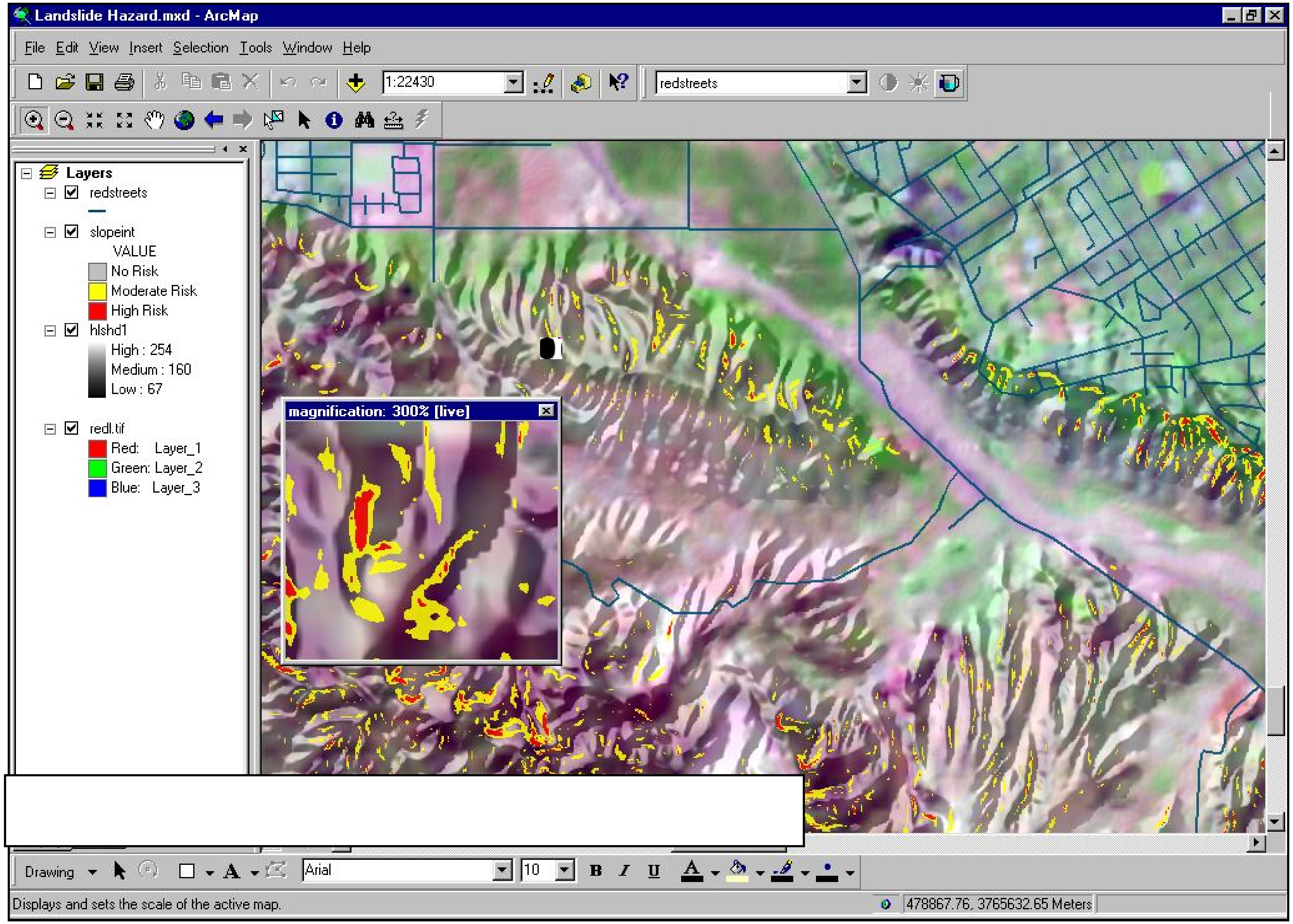
CBS ve Bilgisayar Grafikleri

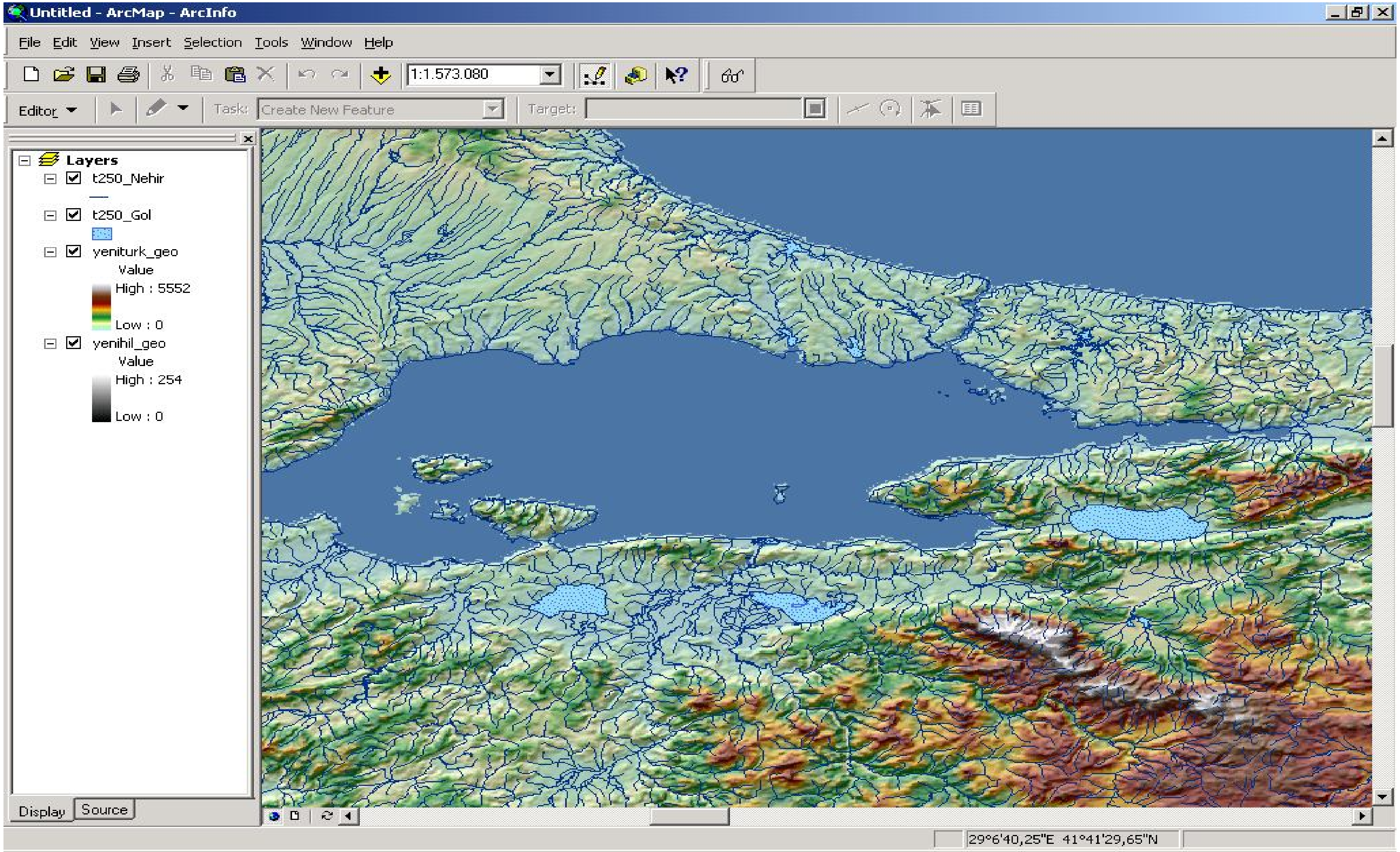
3B Yüzeyler, Gölgelendirmeler



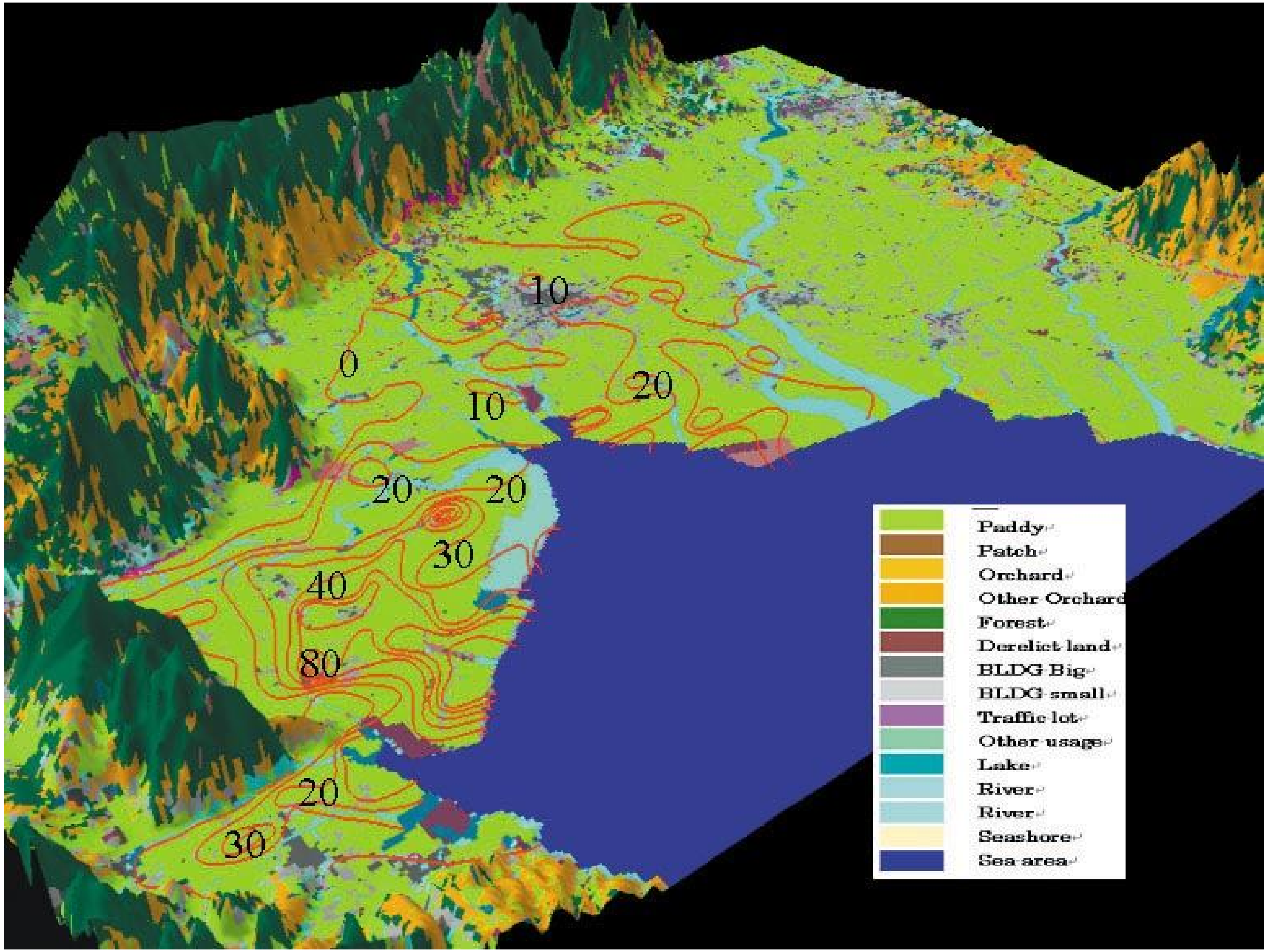
CBS’de 3B Uygulamalar, Gölgelendirmeler



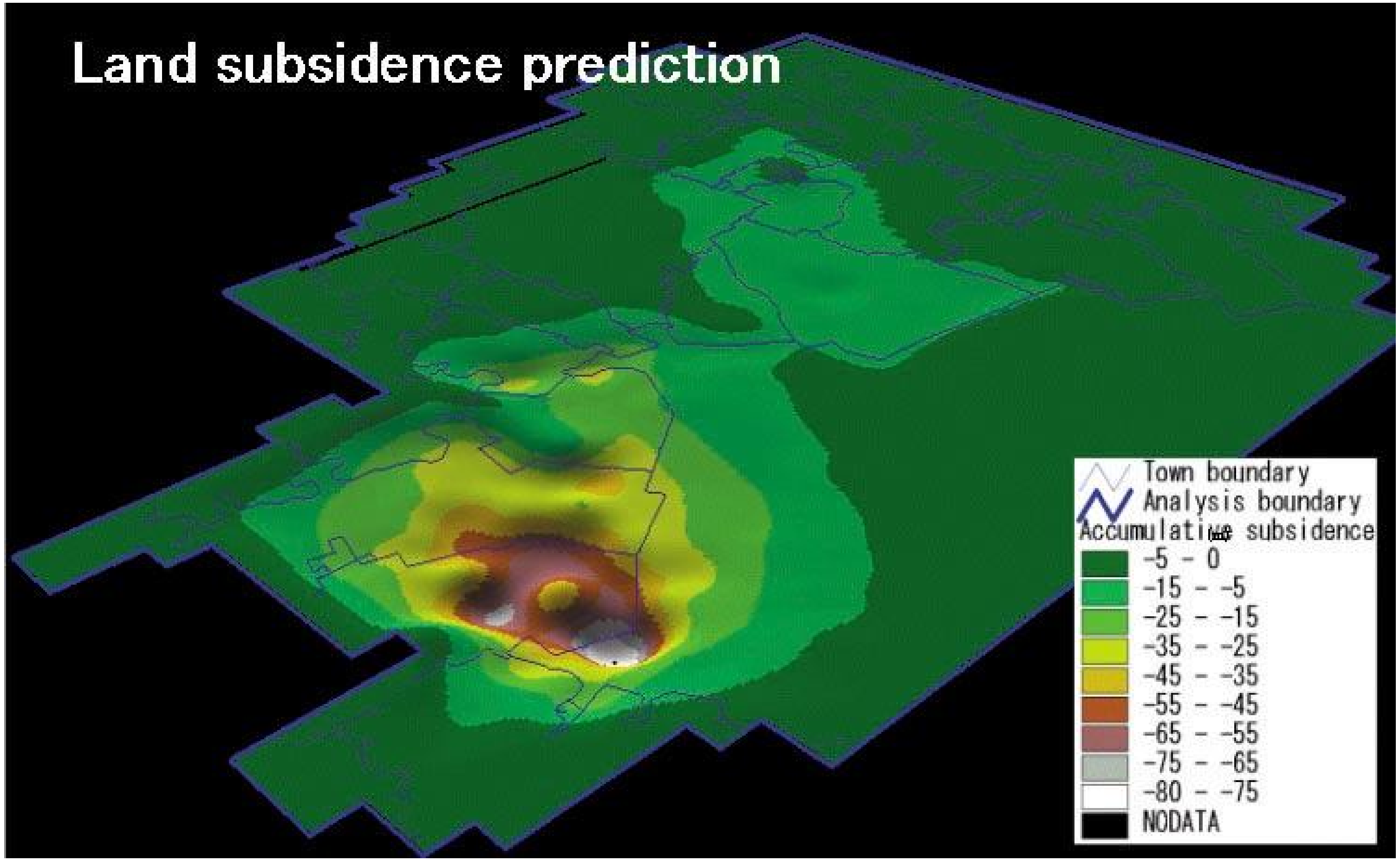
CBS'de 3B Uygulamalar, Gölgelendirmeler



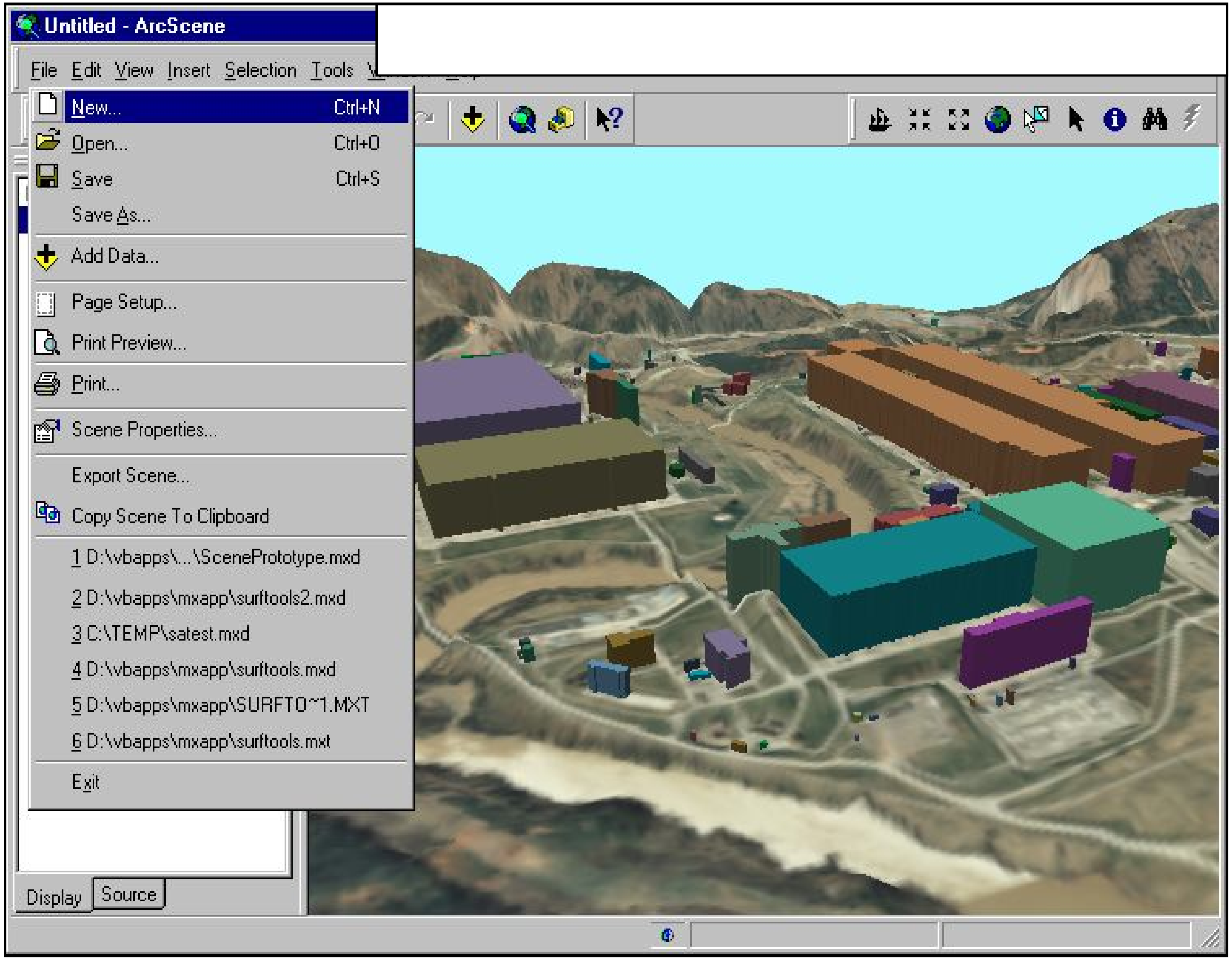
CBS’de 3B Uygulamalar, Gölgelendirmeler



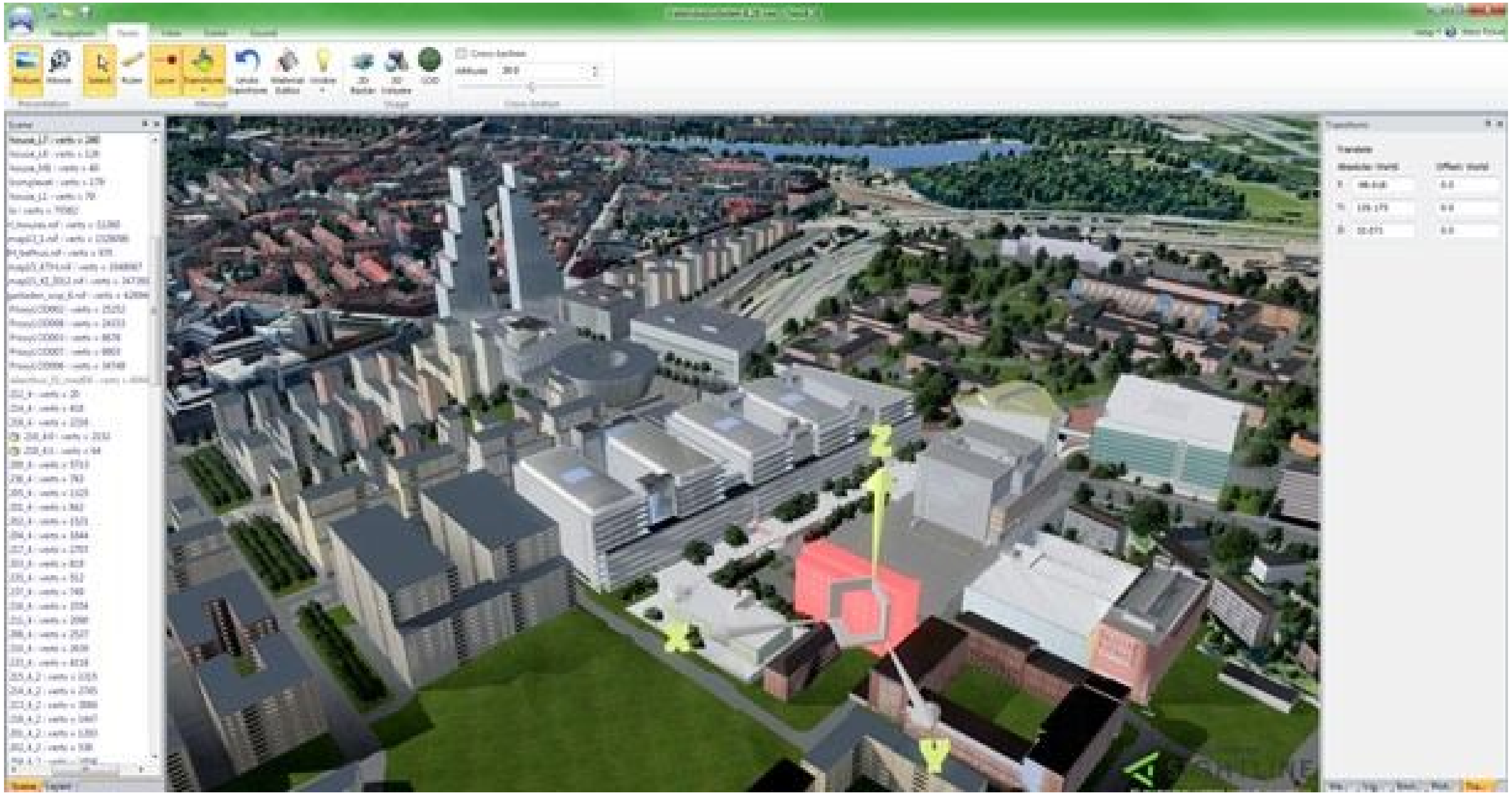
CBS’de 3B Uygulamalar, Gölgelendirmeler



CBS'de 3B Uygulamalar, Yüzeyler (Surface)



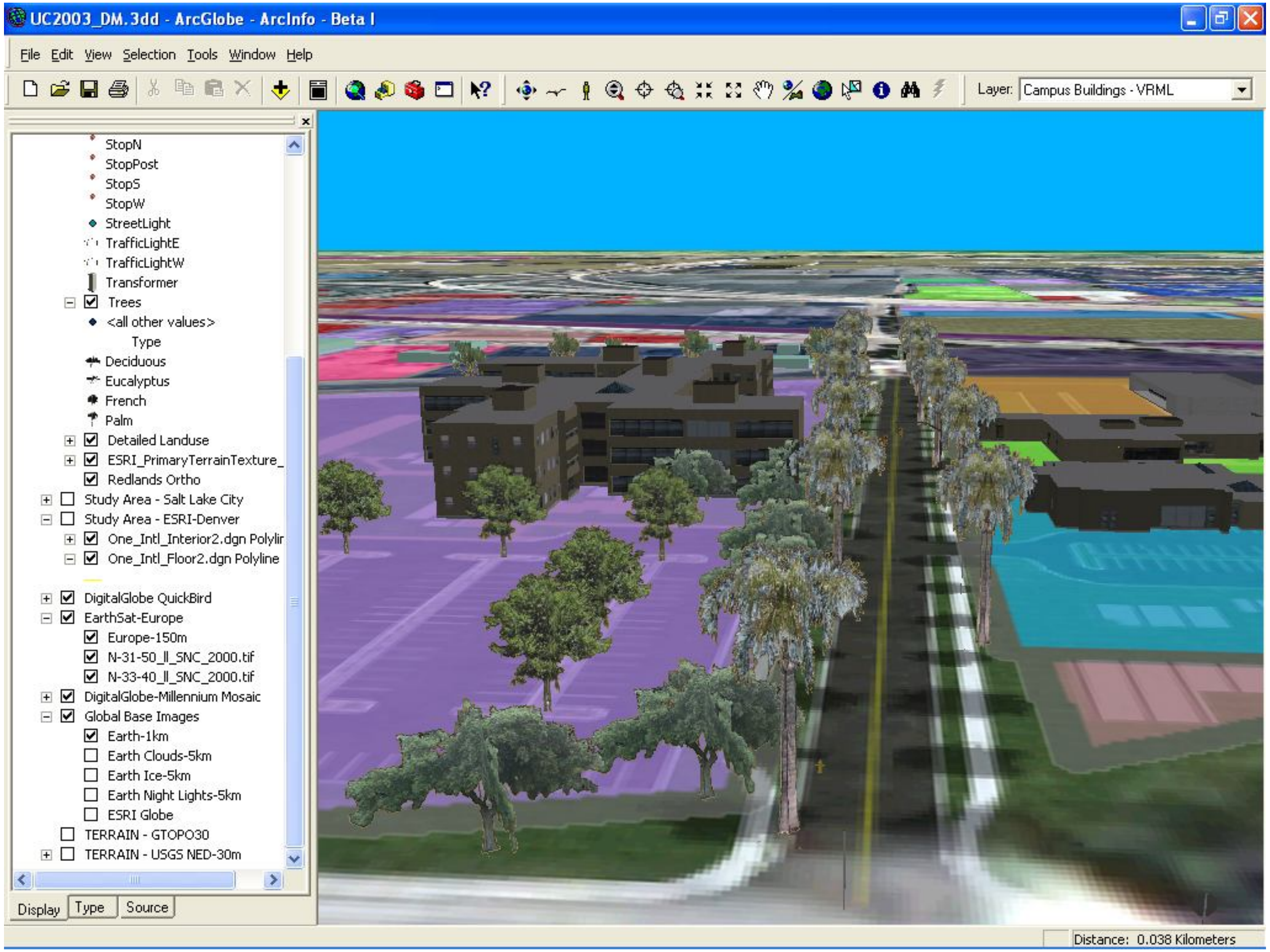
CBS’de 3B Uygulamalar



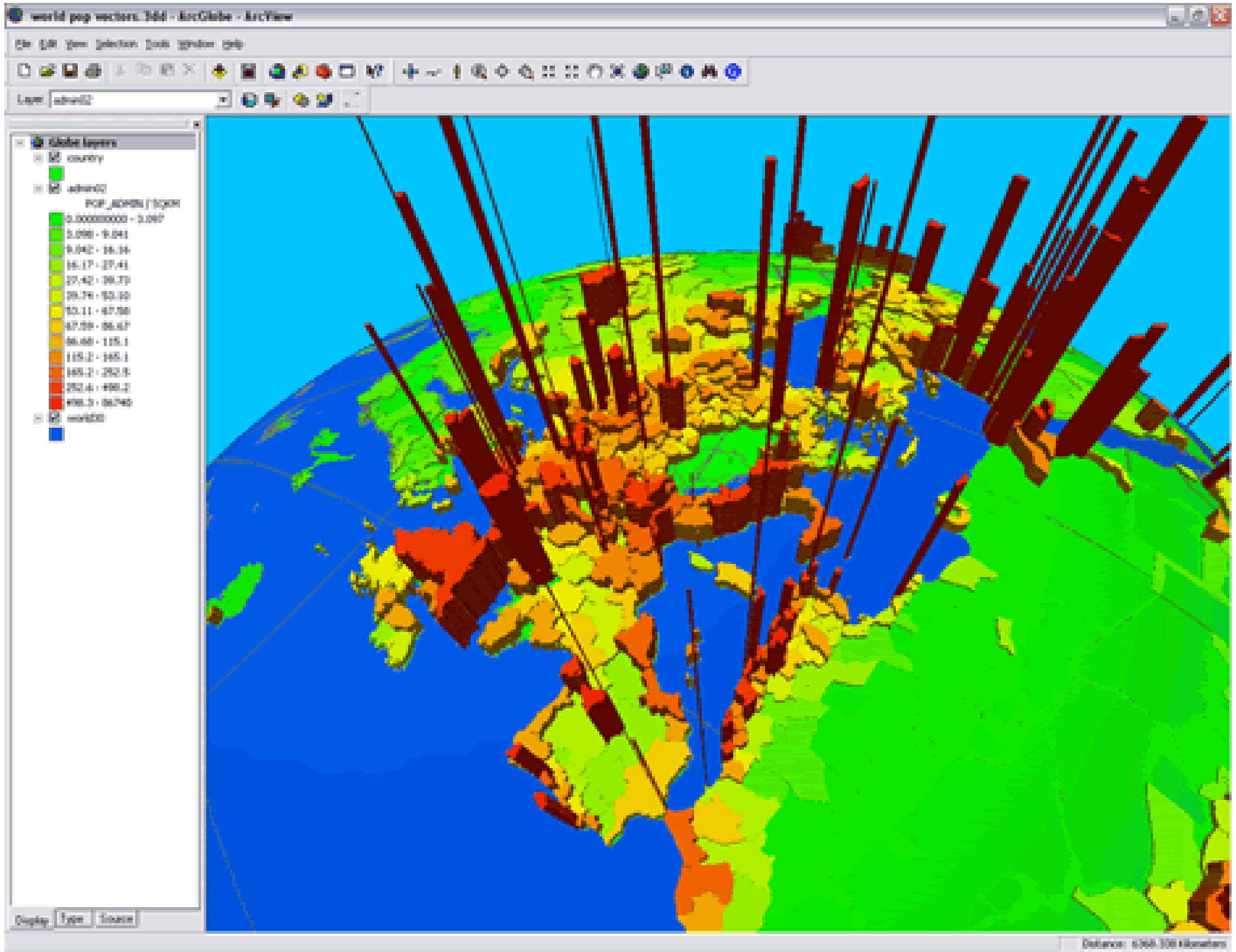
CBS’de 3B Uygulamalar

CBS’de 3B Uygulamalar, Yüzeyler (Surface)

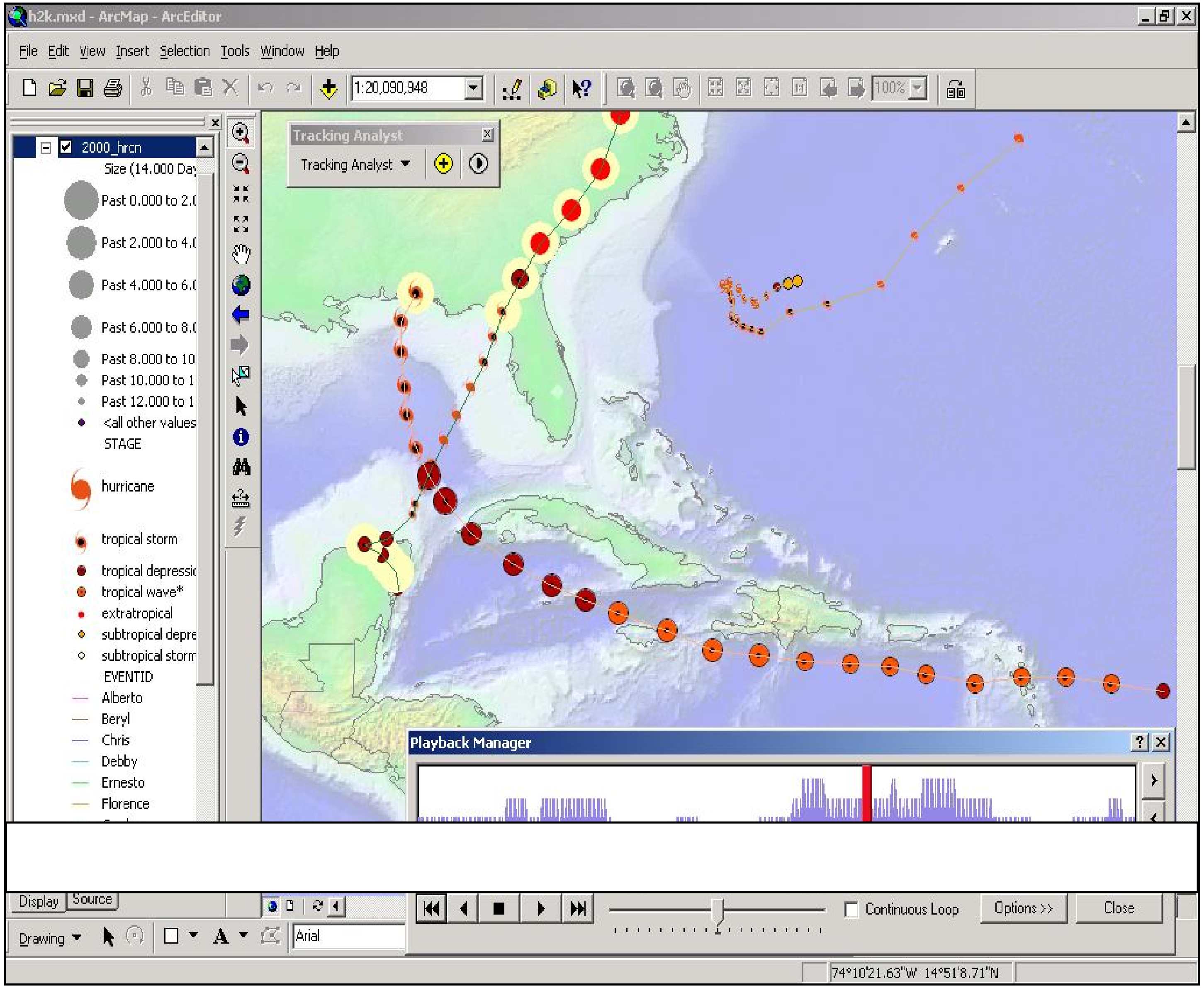
CBS’de 3B Uygulamalar



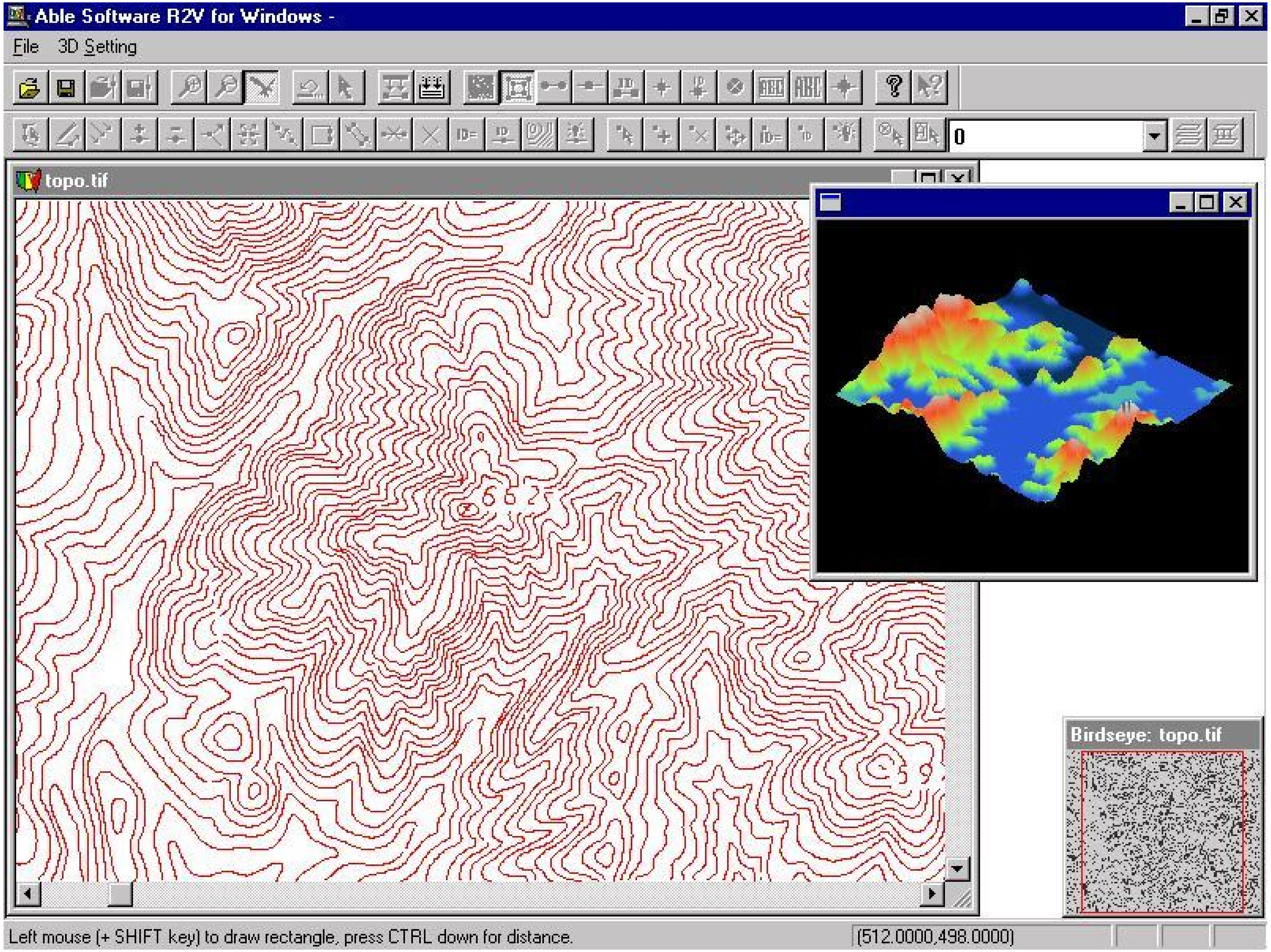
İstatistiki Gösterimler, grafikler



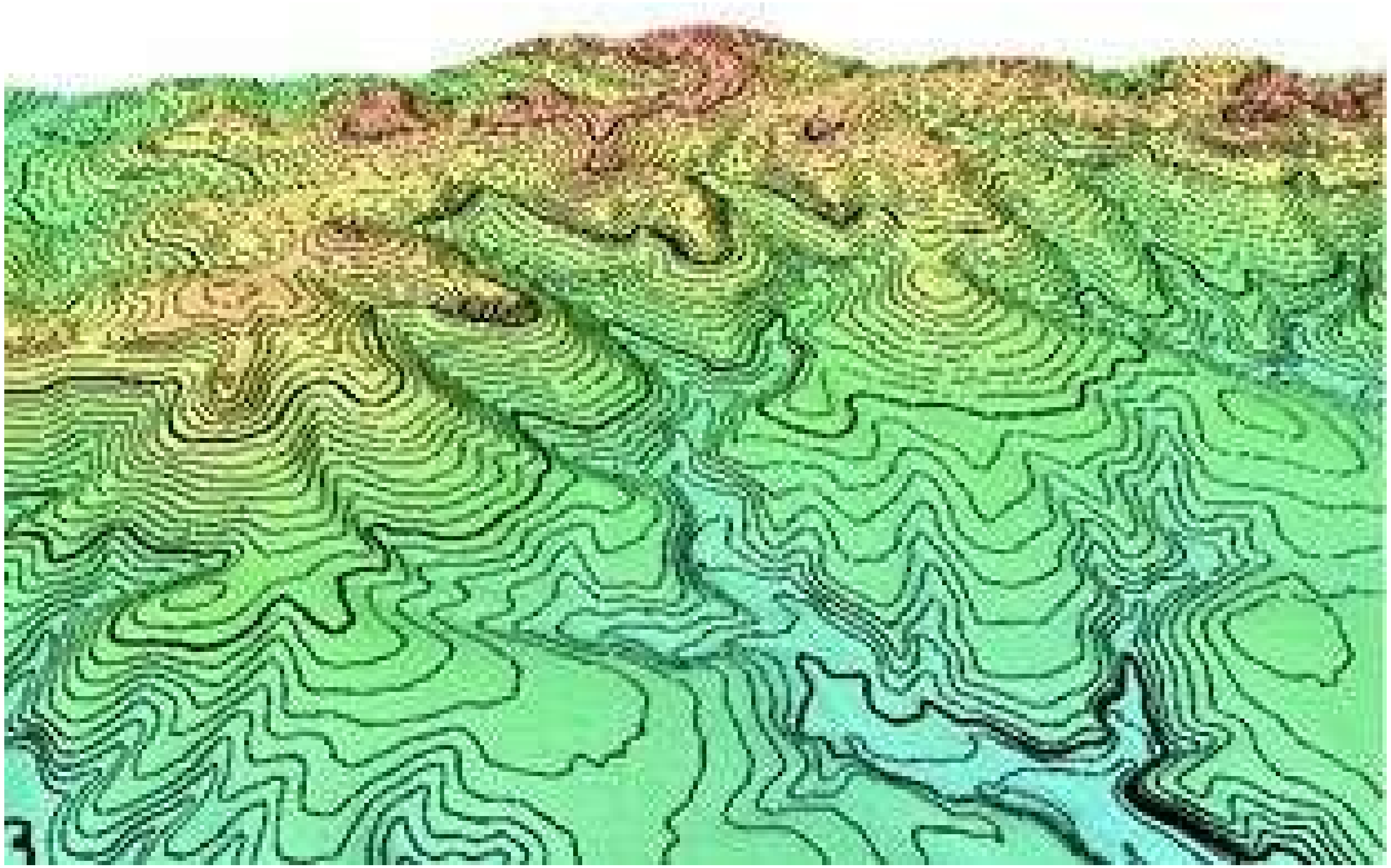
İstatistiki Gösterimler, grafikler

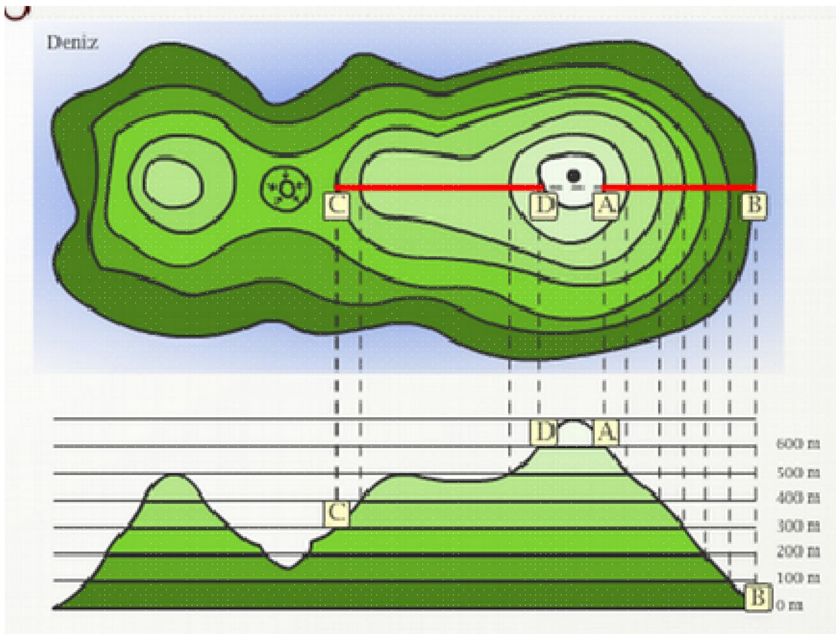


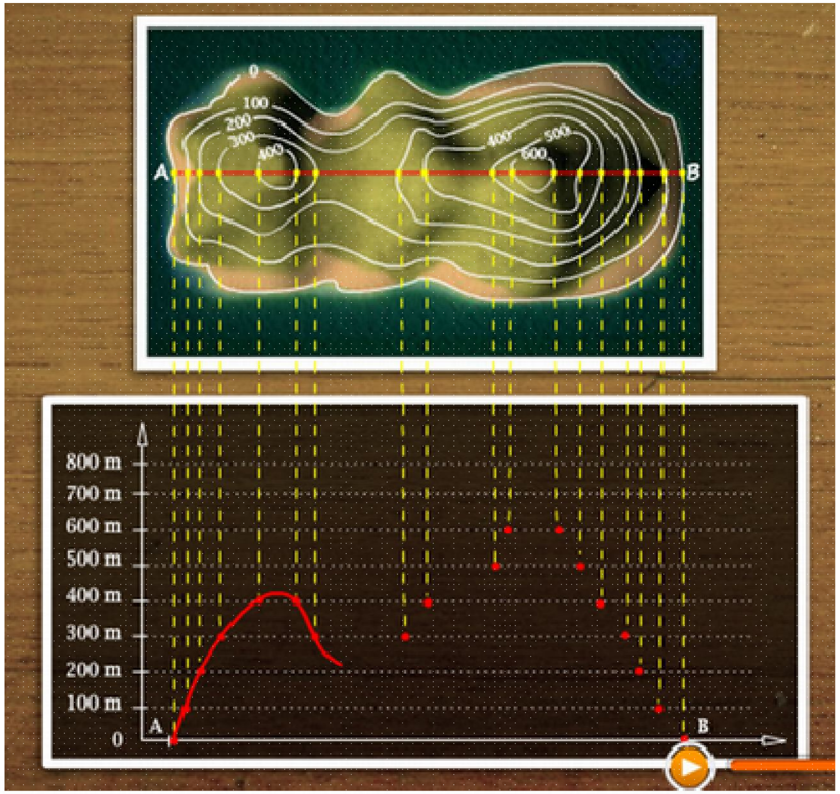
Spline'lar 3B Yüzeyler

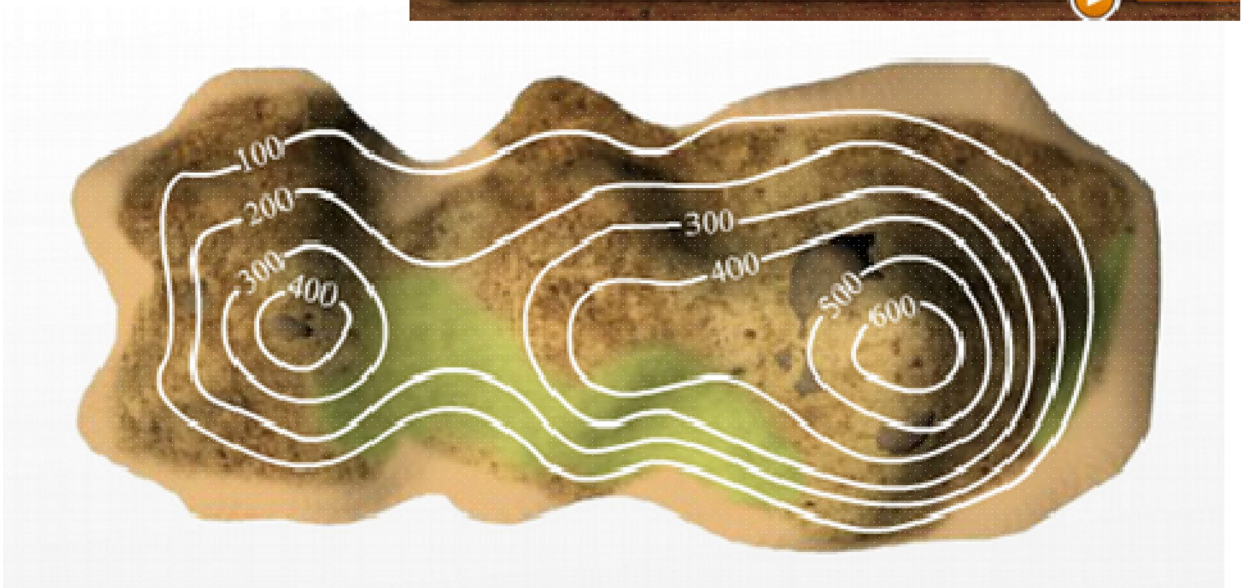


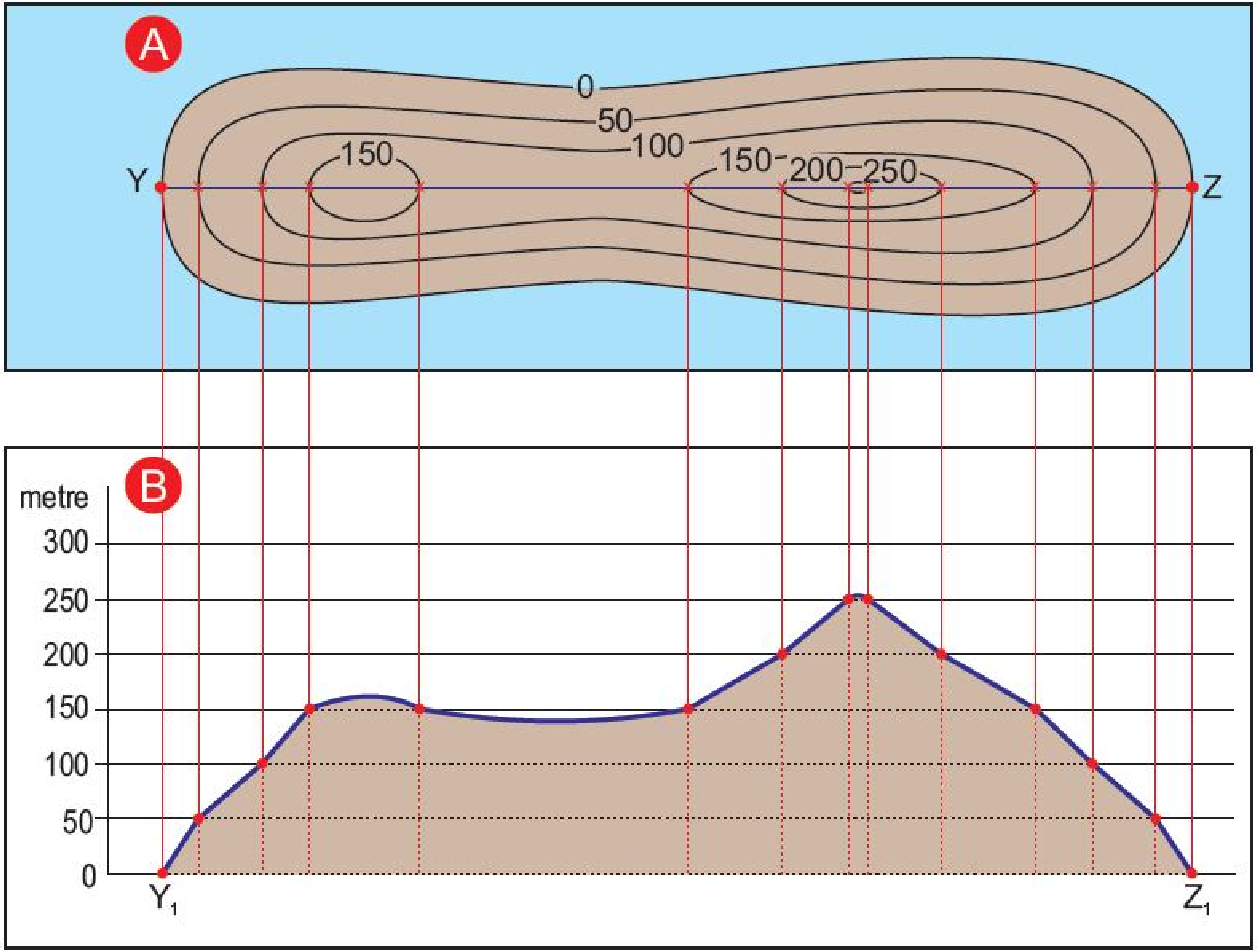
Spline'lar, 3B Yüzeyler



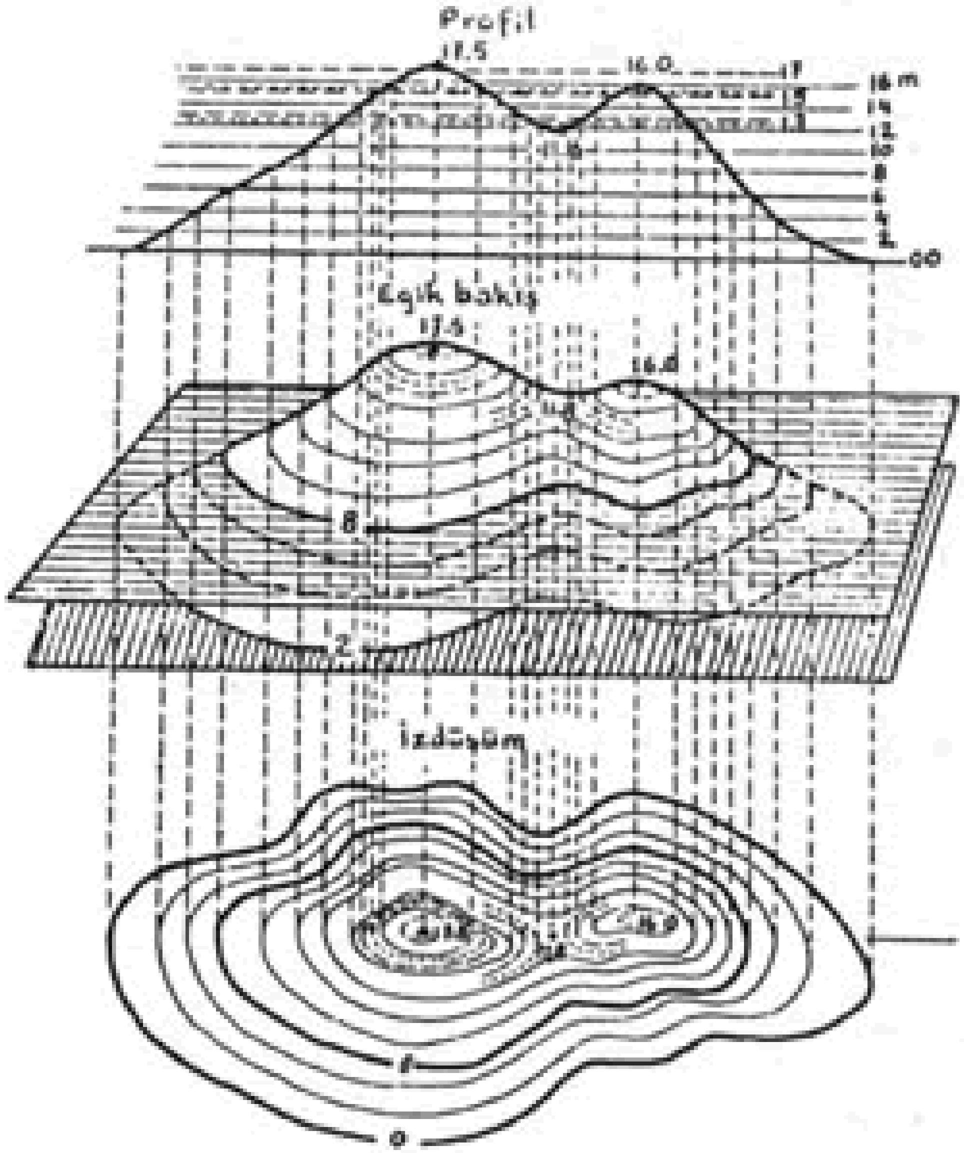

Deniz
C
D
A
B
600 m
500 m
400 m
300 m
200 m
100 m
0 m


0
100
200
300
400
400
500
600
A
B
800 m
700 m
600 m
500 m
400 m
300 m
200 m
100 m
0


100
200
300
400
300
400
500
600

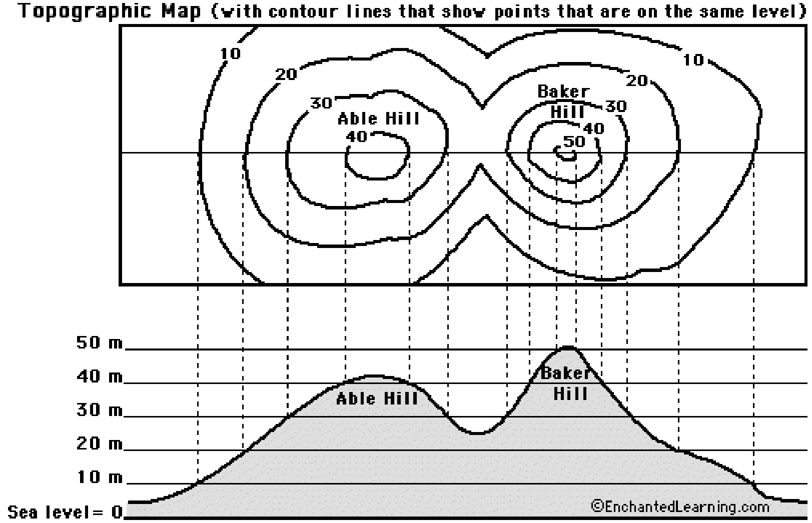


A
0
50
100
150
150
200
250
Y
Z
B
metre
300
250
200
150
100
50
0
Y_1
Z_1

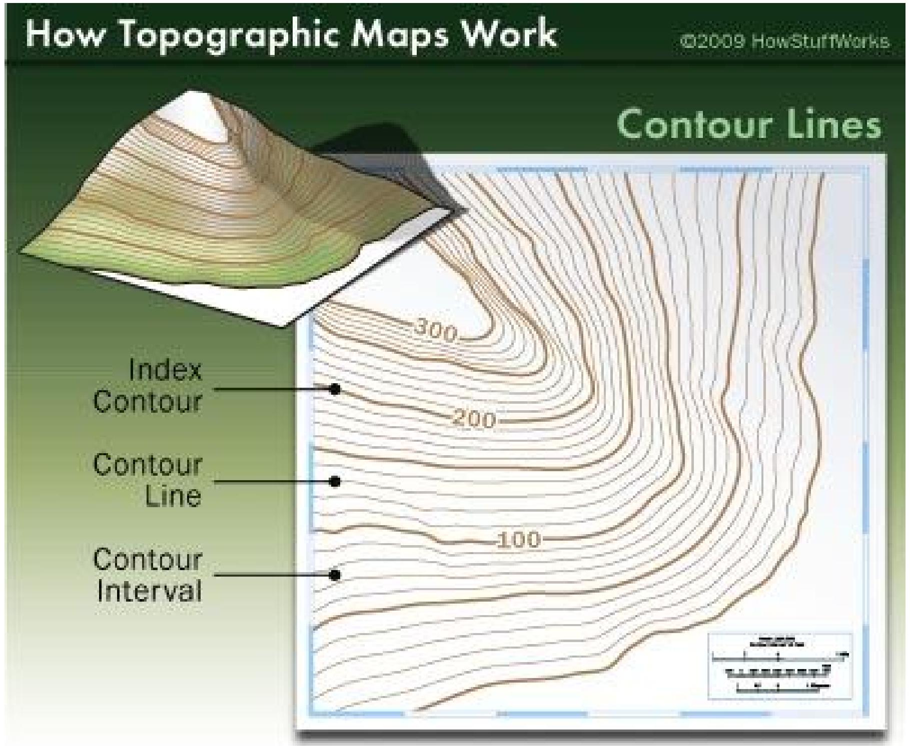


Profil
17.5
16.0
16 m
14
12
10
8
6
4
2
00
Eğik bakış
17.5
16.0
8
2
İzdüşüm
8
0

Topographic Map (with contour lines that show points that are on the same level)



The two hills seen from the side, with elevations marked and dotted lines pointing to the corresponding contour lines.



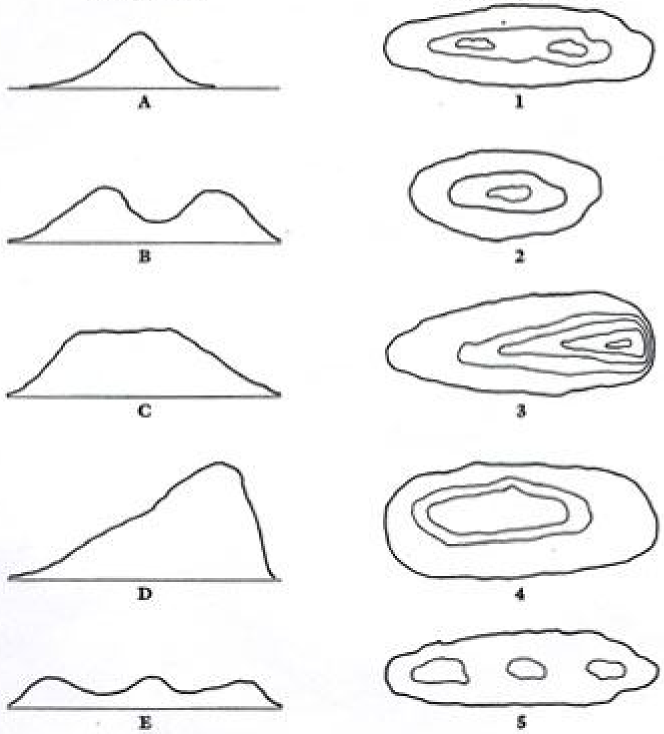
How Topographic Maps Work
©2009 HowStuffWorks
Contour Lines
Index Contour
Contour Line
Contour Interval
300
200
100

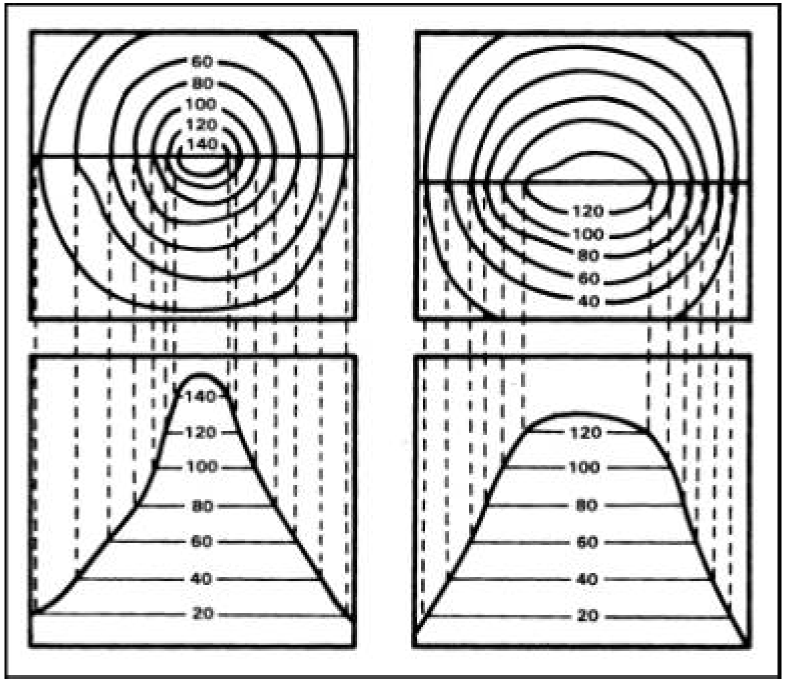
Name ____________________

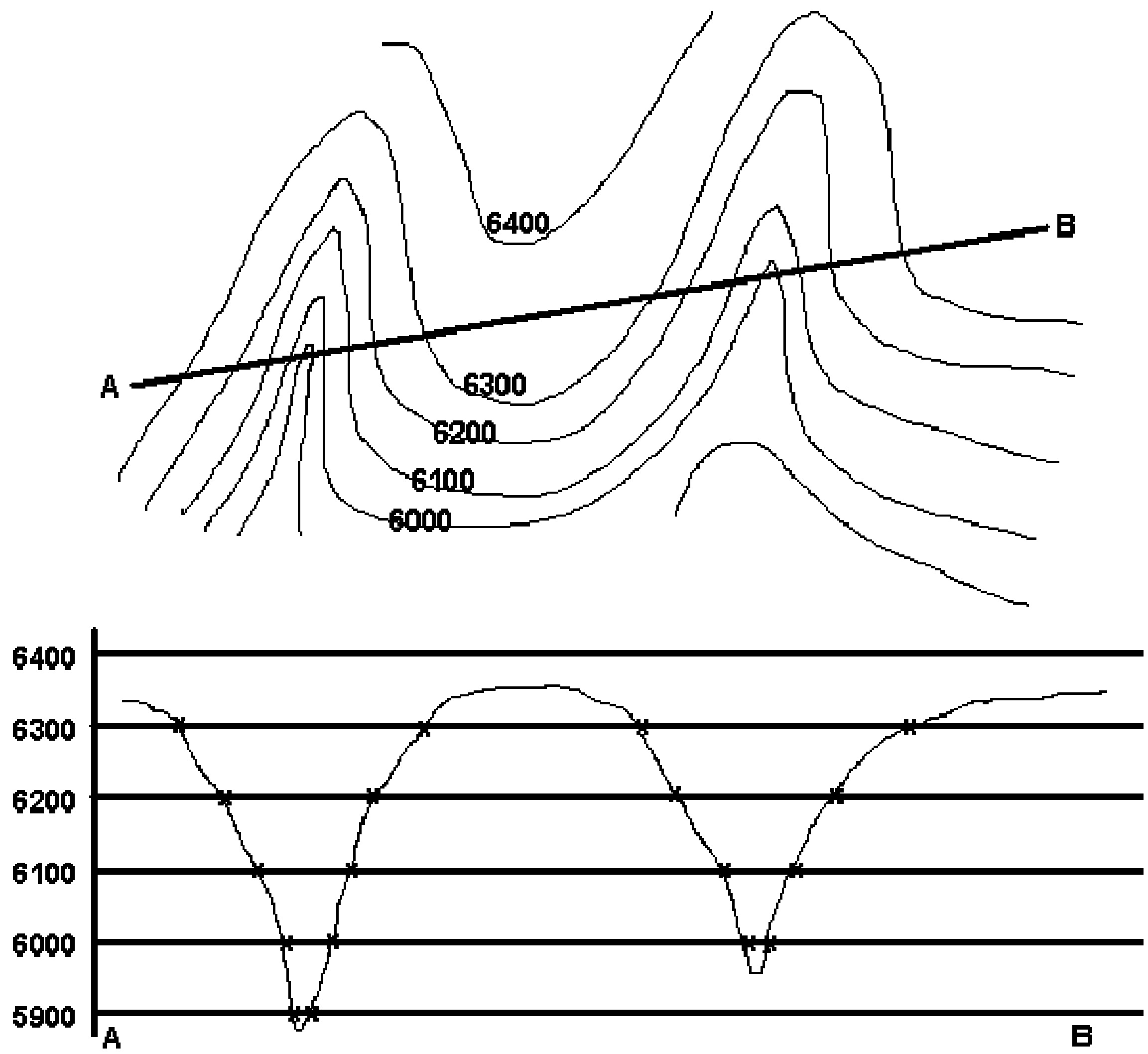
GROUP ACTIVITY C

Matching Elevations Using Cross Sections and Contour Lines

Cross Sections | *Contour Lines*



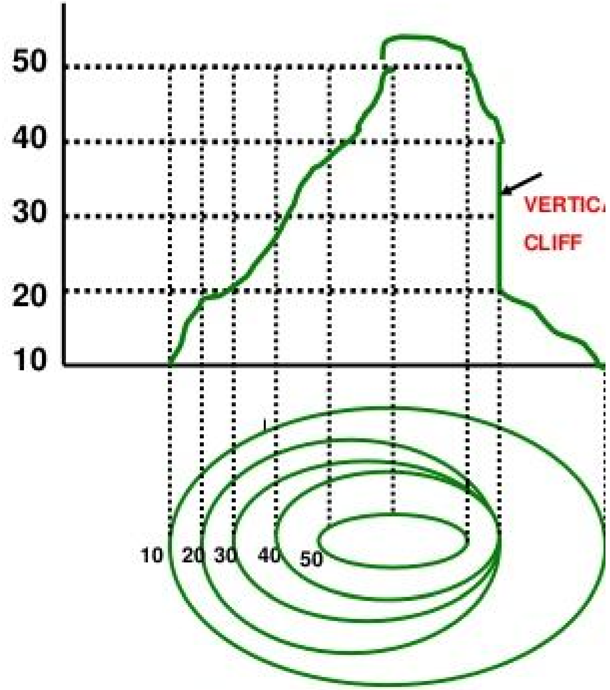




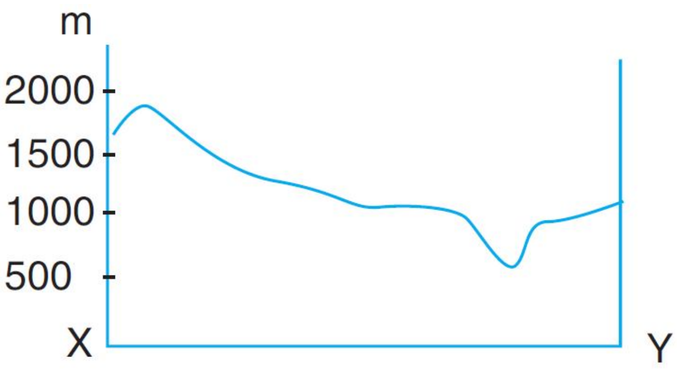
6400
6300
6200
6100
6000
A
B
6400
6300
6200
6100
6000
5900
A
B

CHARACTERISTICS OF CONTOURS

x) Contour lines never run into one another except in the case of a vertical cliff. In this case ,several contours coincide and the horizontal equivalent becomes zero.

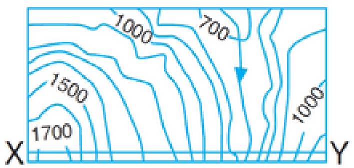


OVERHANGING CLIFF

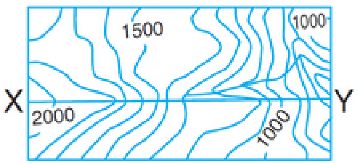


Yandaki profil, aşağıdaki haritaların hangisindeki X–Y doğrultusuna aittir?

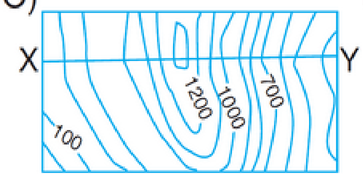
A)



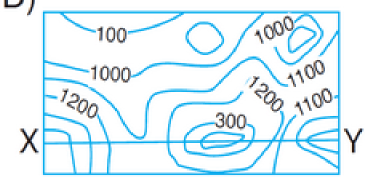
B)



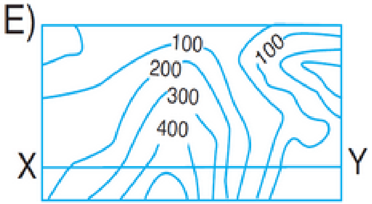
C)



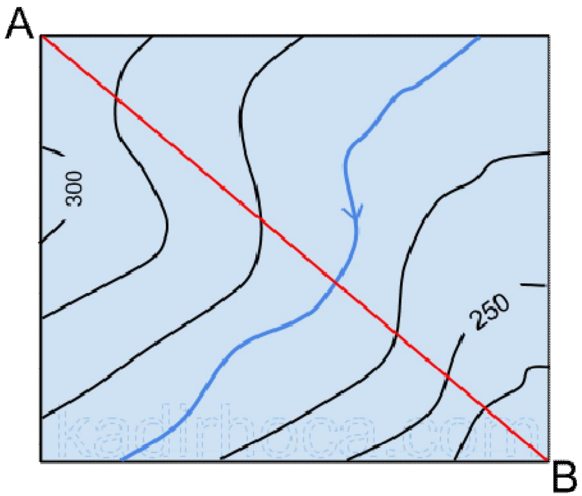
D)



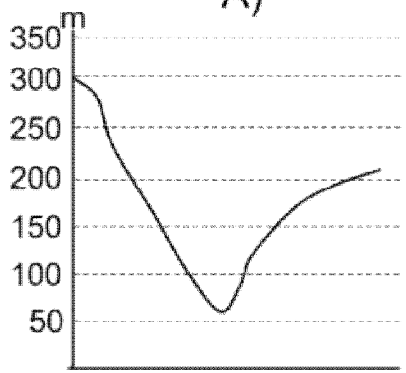
E)



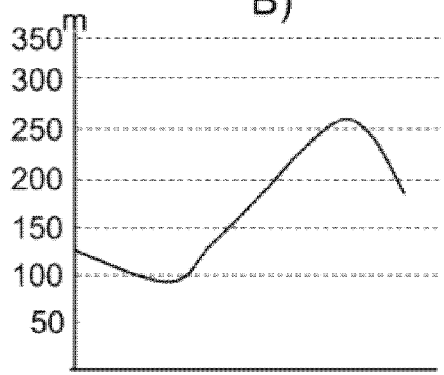
Yandaki izohips haritasında verilen A – B doğrultusunun profili aşağıdakilerden hangisidir?



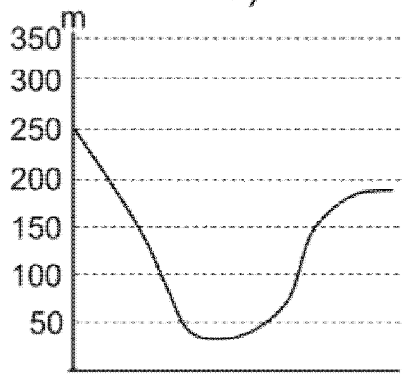
A)



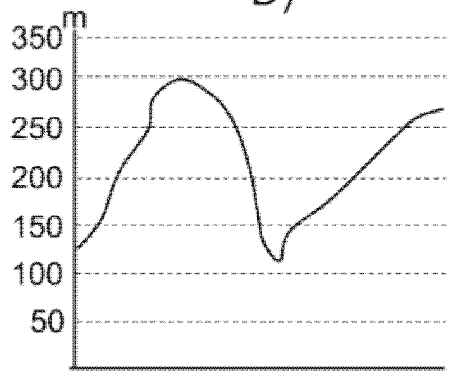
B)



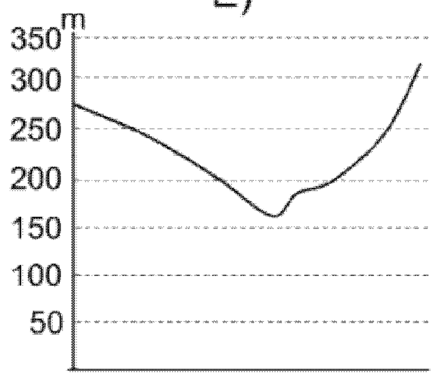
C)



D)

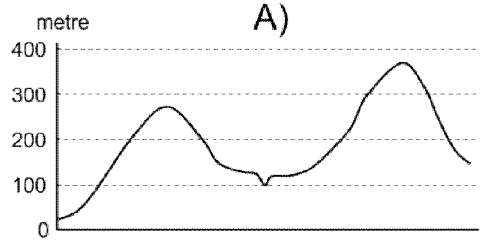


E)

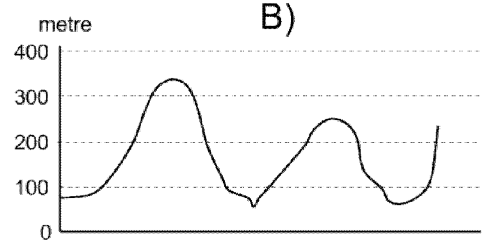


Yukarıdaki haritada görülen arazinin E – F doğrultusundaki profili aşağıdakilerden hangisidir?

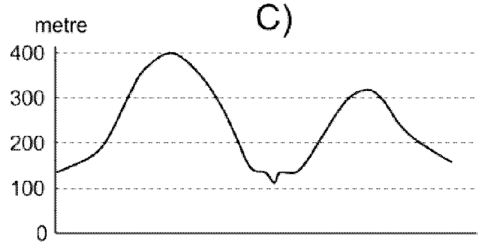
A)



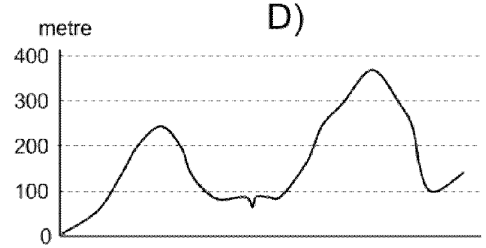
B)



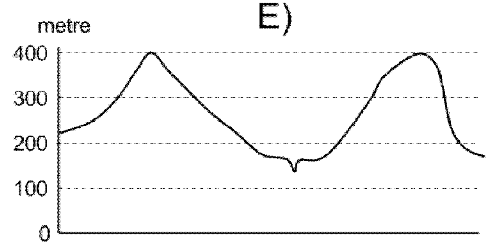
C)

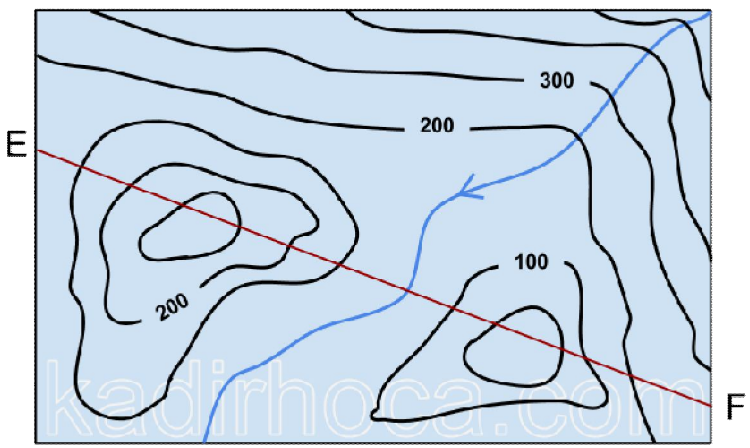


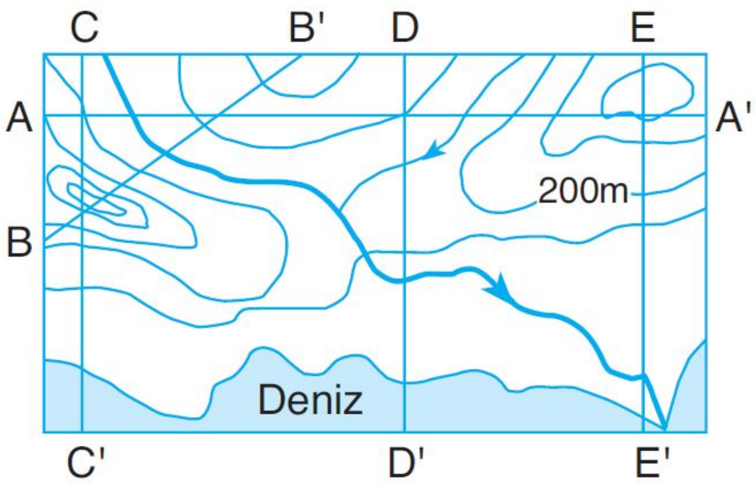
D)

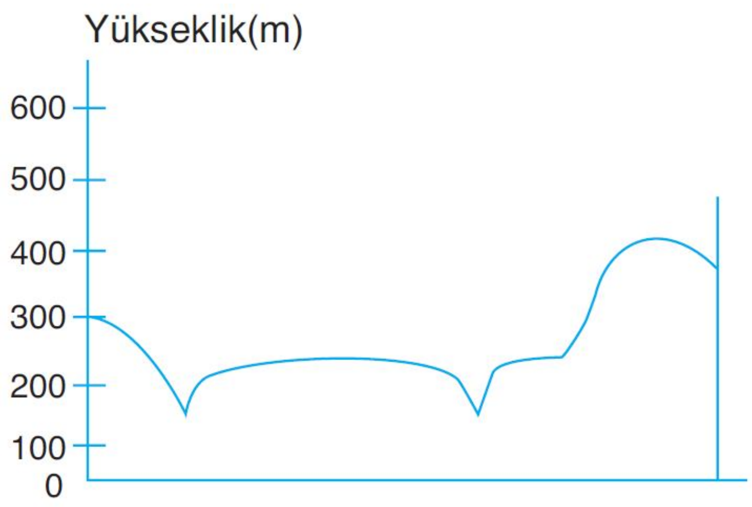


E)









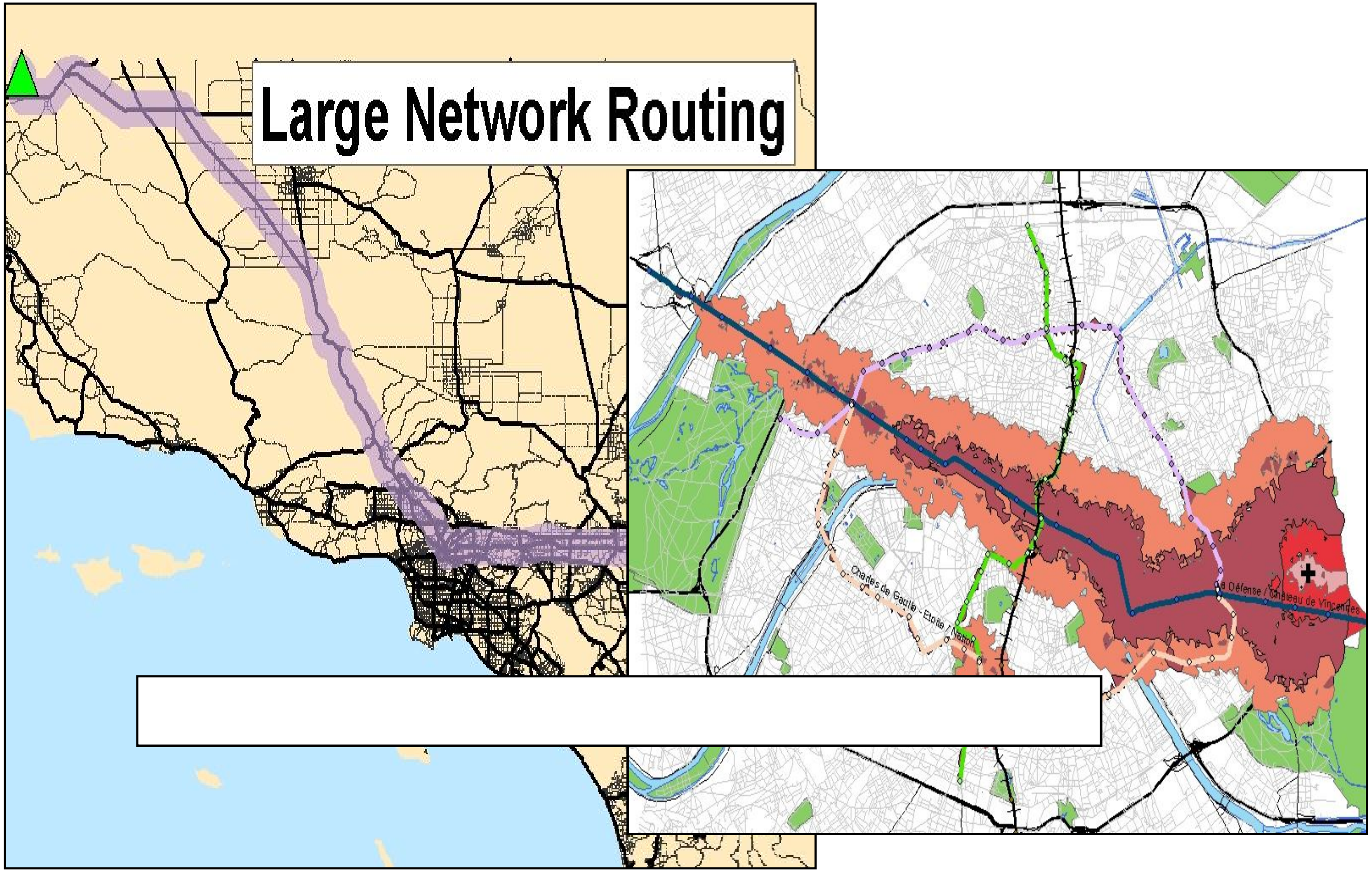
Yukarıda verilen profil, haritadaki doğrultulardan hangisine aittir?

A) A – A' B) B – B'

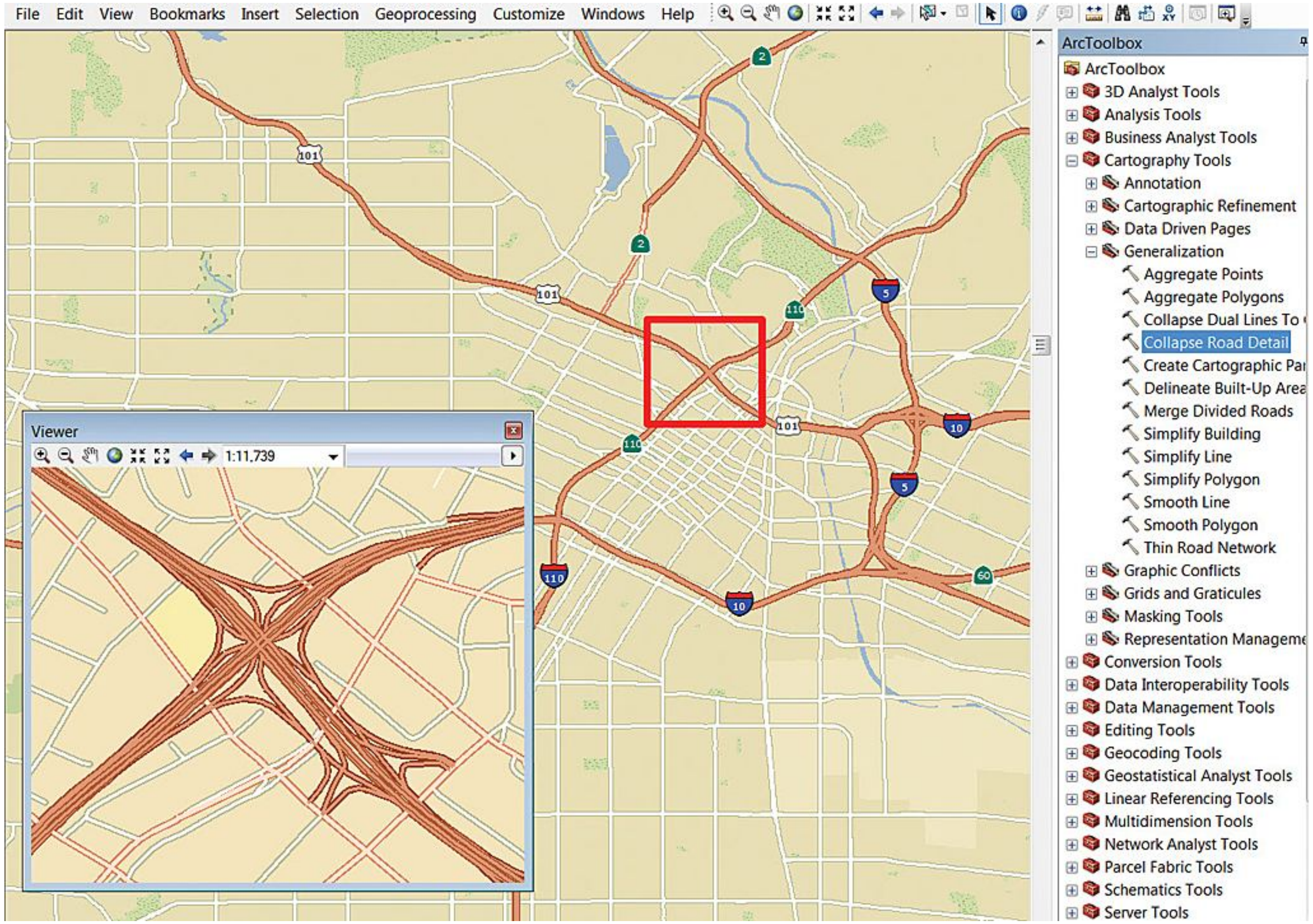
C) C – C' D) D – D'

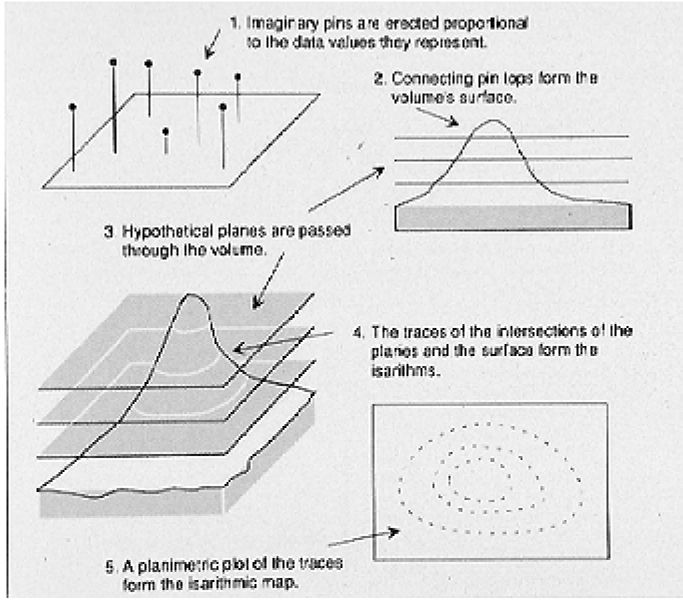
E) E – E'

CBS’de Spline’lar



Genelleştirmede spline lar




1. Imaginary pins are erected proportional to the data values they represent.
2. Connecting pin tops form the volume's surface.
3 Hypothetical planes are passed through the volume.
4. The traces of the intersections of the planes and the surface form the isarithms.
5. A planimetric plot of the traces form the isarithmic map.

2D TRANSLATION (Öteleme)

$$\left.\begin{array}{l} Xp' = Xp + tx \\ Yp' = Yp + ty \end{array}\right\} \quad \begin{pmatrix} Xp' \\ Yp' \end{pmatrix} = \begin{pmatrix} Xp \\ Yp \end{pmatrix} + \begin{pmatrix} tx \\ ty \end{pmatrix}$$

$$P' \quad = \quad P \quad + \quad \mathbf{T}$$

2D SCALING (Ölçekleme)

$$\left.\begin{aligned} Xp' &= Xp * sx \\ Yp' &= Yp * sy \end{aligned}\right\} \quad \begin{pmatrix} Xp' \\ Yp' \end{pmatrix} = \begin{pmatrix} Xp \\ Yp \end{pmatrix} * \begin{pmatrix} sx & 0 \\ 0 & sy \end{pmatrix}$$

$$P' = P * \mathbf{S}$$

2D ROTATION (Döndürme)

$$\left.\begin{array}{l} Xp' = Xp*\cos@ - Yp*\sin@ \\ Yp' = Xp*\sin@ + Yp*\cos@ \end{array}\right\} \begin{pmatrix} Xp' \\ Yp' \end{pmatrix} = \begin{pmatrix} Xp \\ Yp \end{pmatrix} * \begin{pmatrix} \cos@ & -\sin@ \\ \sin@ & \cos@ \end{pmatrix}$$

$$P' \quad = \quad P \quad * \quad \mathbf{R}$$

2D HOMOGENOUS COORDINATES

TRANSFORMATION

$$\begin{pmatrix} Xp' \\ Yp' \\ 1 \end{pmatrix} = \begin{pmatrix} 1 & 0 & tx \\ 0 & 1 & ty \\ 0 & 0 & 1 \end{pmatrix} * \begin{pmatrix} Xp \\ Yp \\ 1 \end{pmatrix}$$

ROTATION

$$\begin{pmatrix} Xp' \\ Yp' \\ 1 \end{pmatrix} = \begin{pmatrix} \cos@ & -\sin@ & 0 \\ \sin@ & \cos@ & 0 \\ 0 & 0 & 1 \end{pmatrix} * \begin{pmatrix} Xp \\ Yp \\ 1 \end{pmatrix}$$

SCALING

$$\begin{pmatrix} Xp' \\ Yp' \\ 1 \end{pmatrix} = \begin{pmatrix} sx & 0 & 0 \\ 0 & sy & 0 \\ 0 & 0 & 1 \end{pmatrix} * \begin{pmatrix} Xp \\ Yp \\ 1 \end{pmatrix}$$

3D

TRANSLATION

$$\begin{pmatrix} Xp' \\ Yp' \\ Zp' \\ 1 \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 & tx \\ 0 & 1 & 0 & ty \\ 0 & 0 & 1 & tz \\ 0 & 0 & 0 & 1 \end{pmatrix} * \begin{pmatrix} Xp \\ Yp \\ Zp \\ 1 \end{pmatrix}$$

SCALING

$$\begin{pmatrix} Xp' \\ Yp' \\ Zp' \\ 1 \end{pmatrix} = \begin{pmatrix} sx & 0 & 0 & 0 \\ 0 & sy & 0 & 0 \\ 0 & 0 & sz & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix} * \begin{pmatrix} Xp \\ Yp \\ Zp \\ 1 \end{pmatrix}$$

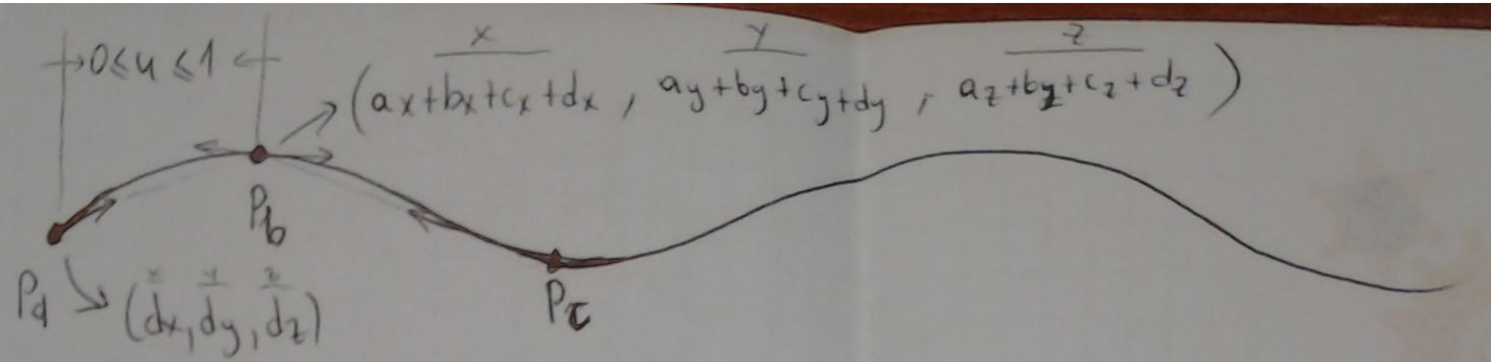
3D ROTATION

$$\begin{pmatrix} Xp' \\ Yp' \\ Zp' \\ 1 \end{pmatrix} = \underbrace{\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & \cos@ & -\sin@ & 0 \\ 0 & \sin@ & \cos@ & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}}_{\text{R matrix for rotating about X axe}} * \begin{pmatrix} Xp \\ Yp \\ Zp \\ 1 \end{pmatrix}$$

$$\underbrace{\begin{pmatrix} \cos@ & 0 & -\sin@ & 0 \\ 0 & 1 & 0 & 0 \\ \sin@ & 0 & \cos@ & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}}_{\text{R matrix for rotating about Y axe}} \qquad \underbrace{\begin{pmatrix} \cos@ & -\sin@ & 0 & 0 \\ \sin@ & \cos@ & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}}_{\text{R matrix for rotating about Z axe)}}$$

SPLINES (Parametric Cubic Curves)

- Hermite Form
- Bezier Form
- B-Spline Form



u öyle bir parametre olsun ki, bu parametre 0'dan 1'e kadar artarken,

$$x(u) = a_x u^3 + b_x u^2 + c_x u + d_x$$
$$y(u) = a_y u^3 + b_y u^2 + c_y u + d_y$$
$$z(u) = a_z u^3 + b_z u^2 + c_z u + d_z$$

$0 \leq u \leq 1$

$P(u) = au^3 + bu^2 + cu + d$ (üstteki 3'ü yerine kısaca bunu yazalım)

aldığı her değer yukarıdaki denklemlerde yerine konduğunda oluşan x,y,z koordinatlarını nokta olarak ekrana bastığımızda P_0'la P_1 arasındaki curve'i oluştursun.

P_aP_b kurbu ile P_bP_c kurbunun P_b noktasında yumuşak bir geçiş yapabilesi için her iki kurbun da P_b noktasındaki türevleri birbirine eşit olmalı. (Bir fonksiyonun bir noktasındaki ~~tanjant~~ türevi o noktadaki tepetin tanjantına (eğimine) eşittir) Dolayısı ile öyle bir parametrik fonksiyon yazmalıyız ki yukarıdaki gibi... bunu sağlasın. Yani öyle bir fonksiyon olmalı ki hem P_a'dan hem P_b'den geçsin, hem de istediğimiz eğimle geçsin.

P_a'dan ve P_b'deki

$$P(u) = \underbrace{\begin{bmatrix} u^3 & u^2 & u & 1 \end{bmatrix}}\begin{bmatrix} a \\ b \\ c \\ d \end{bmatrix}$$

Bu ikisinde u yerine 0 ve 1 koyarsak (P_a'da $u=0$, P_b'de $u=1$ olacağından)

$k=a$

$k+1=b$

$P(0)=P_k$

$P(1)=P_{k+1}$

$P'(0)=DP_k$

$P'(1)=DP_{k+1}$

$$P'(u) = \underbrace{\begin{bmatrix} 3u^2 & 2u & 1 & 0 \end{bmatrix}}\begin{bmatrix} a \\ b \\ c \\ d \end{bmatrix} \Rightarrow \begin{bmatrix} P_k \\ P_{k+1} \\ DP_k \\ DP_{k+1} \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 \\ 3 & 2 & 1 & 0 \end{bmatrix} \cdot \begin{pmatrix} a \\ b \\ c \\ d \end{pmatrix}$$

$$\begin{bmatrix} a \\ b \\ c \\ d \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 \\ 3 & 2 & 1 & 0 \end{bmatrix}^{-1} \cdot \begin{bmatrix} P_k \\ P_{k+1} \\ DP_k \\ DP_{k+1} \end{bmatrix}$$

$$= \begin{bmatrix} 2 & -2 & 1 & 1 \\ -3 & 3 & -2 & -1 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix} \begin{bmatrix} P_k \\ P_{k+1} \\ DP_k \\ DP_{k+1} \end{bmatrix}$$

Dolayısı ile;

$$P(u) = \begin{bmatrix} u^3 & u^2 & u & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 & -2 & 1 & 1 \\ -3 & 3 & -2 & -1 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix} \cdot \begin{bmatrix} P_k \\ P_{k+1} \\ DP_k \\ DP_{k+1} \end{bmatrix}$$

$$P(u) = P_k(2u^3-3u^2+1) + P_{k+1}(-2u^3+3u^2) + DP_k(u^3-2u^2+u) + DP_{k+1}(u^3-u^2)$$

$$x(u) = x_k(2u^3-3u^2+1) + x_{k+1}(-2u^3+3u^2) + x'_k(u^3-2u^2+u) + x'_{k+1}(u^3-u^2)$$

$y(u) = \ldots$

$z(u) = \ldots$

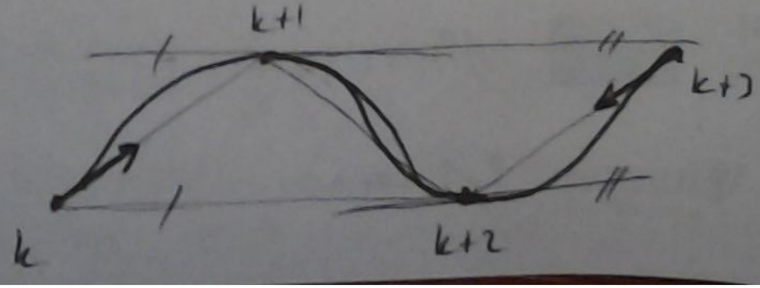
$$x'_k = \frac{1}{2}(1-t)(x_{k+1} - x_k)$$

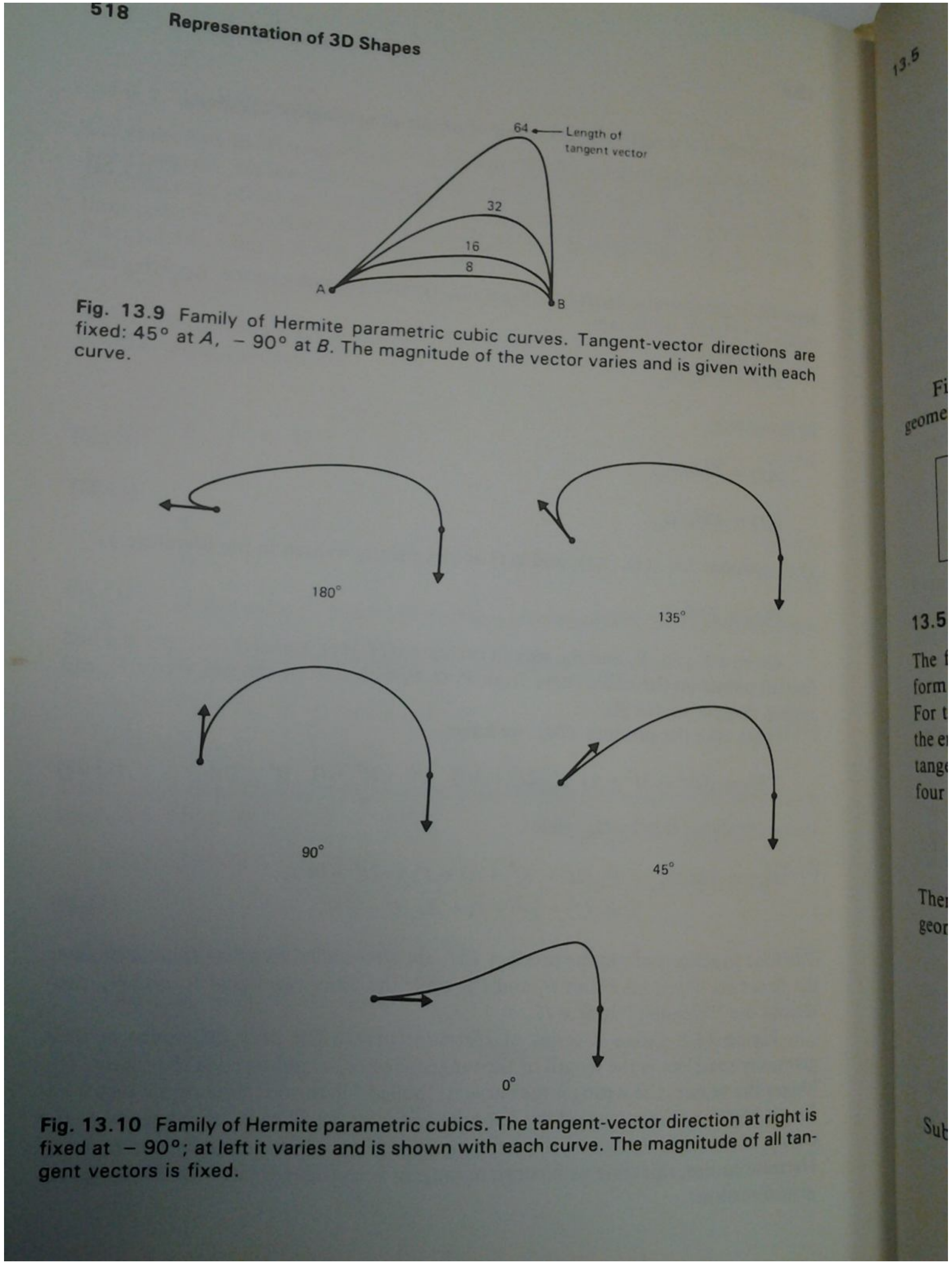
$$y'_k = \frac{1}{2}(1-t)(y_{k+1} - y_k)$$

$$x'_{k+1} = \frac{1}{2}(1-t)(x_{k+2} - x_k)$$

$$y'_{k+1} = \frac{1}{2}(1-t)(x_{k+2} - y_k)$$

Hearn-Baker'in kitabından… Cardinal Spline: Gerçek türevler yerine, ortalama koordinatlar alınarak kabul edilebilecek türevler.





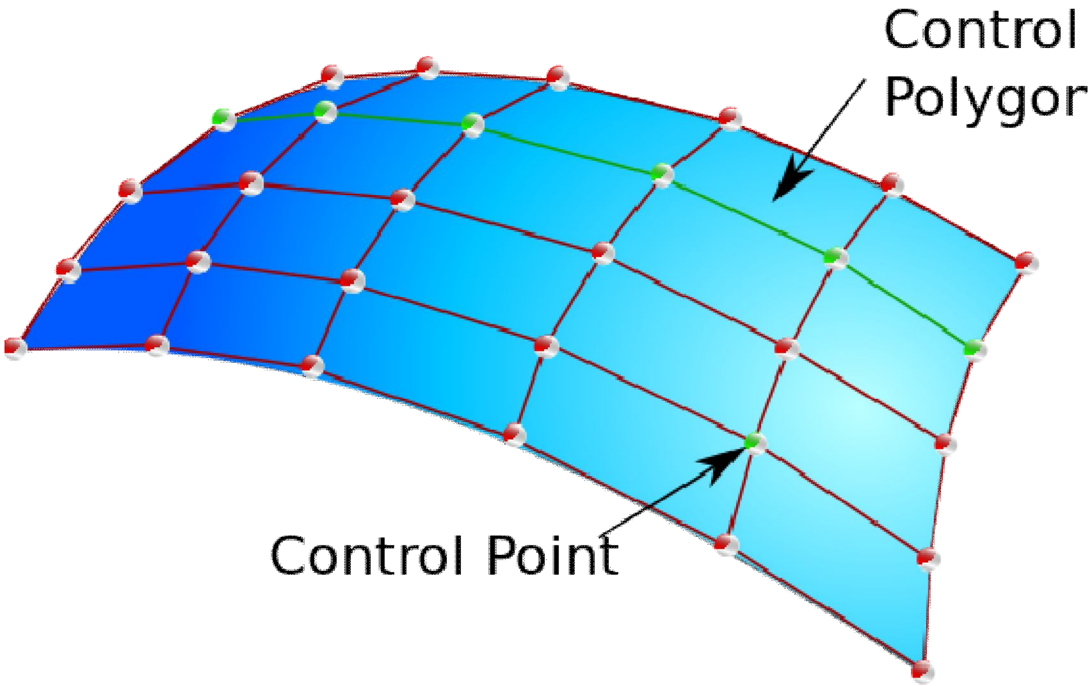
Gerilim farklı, çıkış eğimleri (Tangent vector)

sabit

Gerilim sabit, çıkış eğimleri (Tangent vector)

farklı

Parametric Cubic Surfaces



Parametric Cubic Surfaces

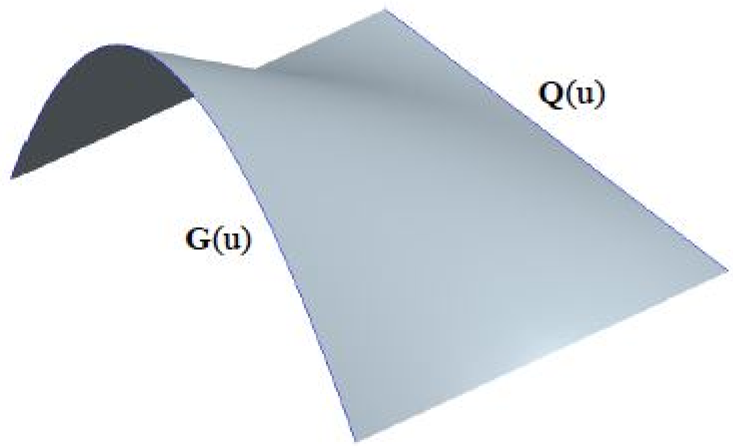
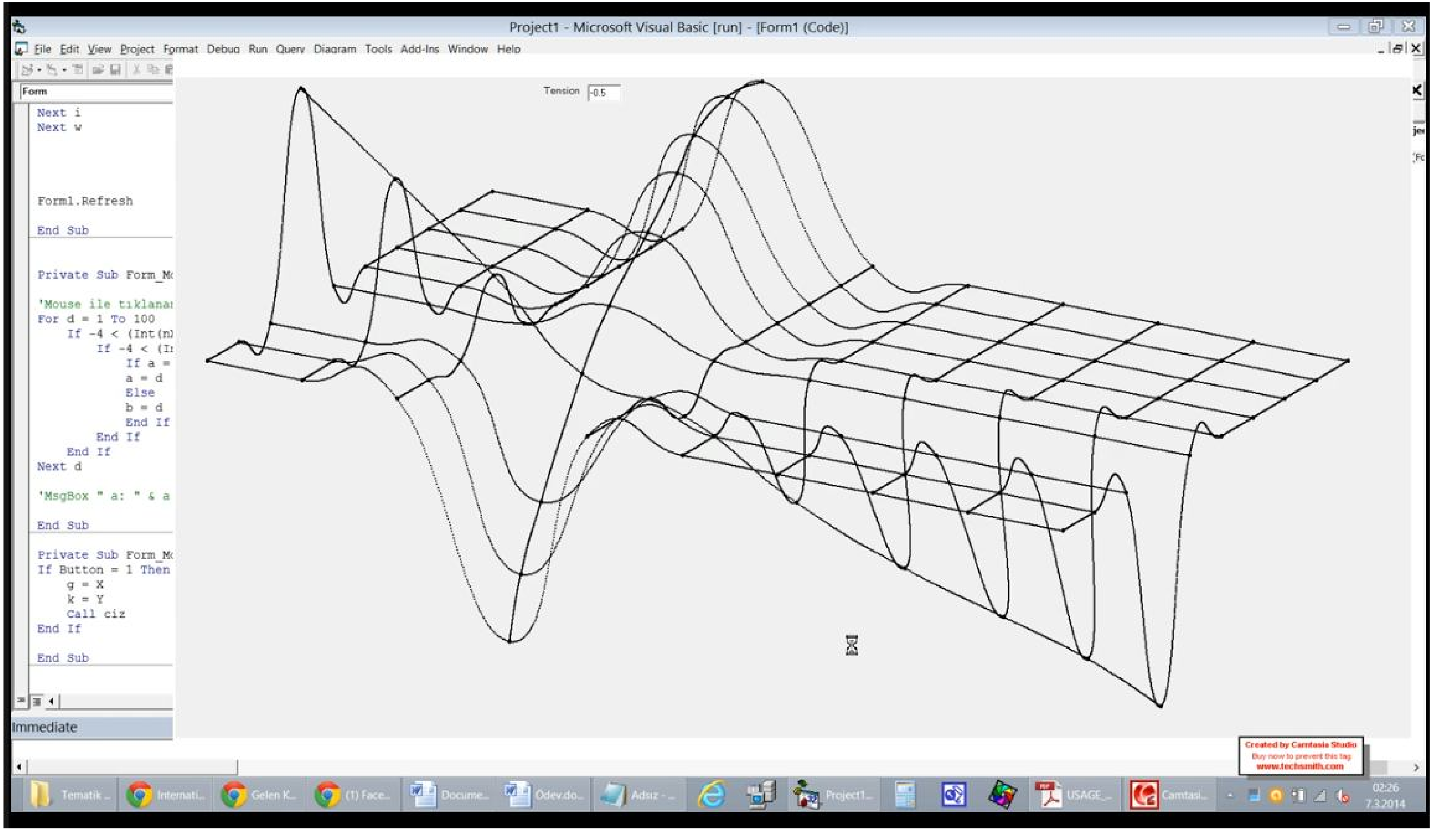


Figure 2: Ruled surface composed of a Hermite cubic spline and a line.


Project1 - Microsoft Visual Basic [run] - [Form1 (Code)]
File Edit View Project Format Debug Run Query Diagram Tools Add-Ins Window Help
Form
Next i
Next w
Form1.Refresh
End Sub
Private Sub Form_M
'Mouse ile tıklanan
For d = 1 To 100
If -4 < (Int(n
If -4 < (I
If a =
a = d
Else
b = d
End If
End If
End If
Next d
'MsgBox " a: " & a
End Sub
Private Sub Form_M
If Button = 1 Then
g = X
k = Y
Call ciz
End If
End Sub
Immediate
Tension
-0.5
Created by Camtasia Studio
Buy now to prevent this tag
www.techsmith.com
02:26
7.3.2014