

# ADAPTATION OF HIGH RESOLUTION IKONOS IMAGES TO GOOGLEEARTH FOR ZONGULDAK TEST FIELD

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## Outline

- ✓ Study Area
- ✓ Strategy
- ✓ Application
- ✓ Conclusions

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## STUDY AREA



### General Description of the Study Area Zonguldak

The Study area Zonguldak City is located in north-west part of Turkey. The City is famous with being one of the main coal mining areas in the world. Although losing economical interest, there are several coal mines still active in Zonguldak. Figure shows the study area's location on the world map.

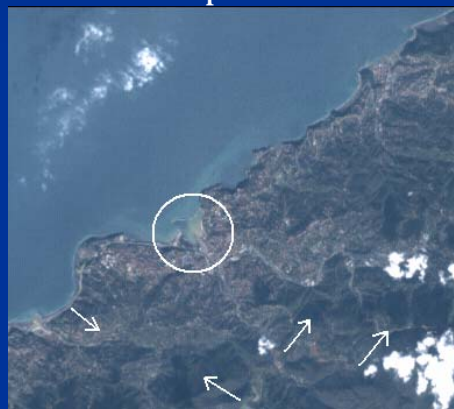


Fig.2.2: Ikonos image of Zonguldak testfield

## Characteristic of Study Area

Zonguldak has very rough and mountainous topography that's why terrain inclination has a big influence on the accuracy of the results. Figure 2-2. shows the Ikonos space image of study area. At the upper side of the image, in the white circle, the city centre and harbour can be seen. The mountainous topography is obvious and the narrows show the highest terrain.

The mountainous topography is obvious and the narrows show the highest terrain. the elevations reach 1646m and the average terrain inclination is %23. Figure 2-3. shows the three dimension colour representation of the study area and the frequency distribution of terrain inclination can be seen in Figure 2-4.

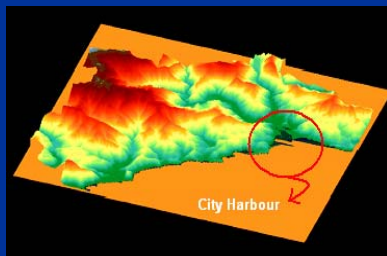


Figure 2-3: 3D colour version of Test Field  
Red: Highest terrain

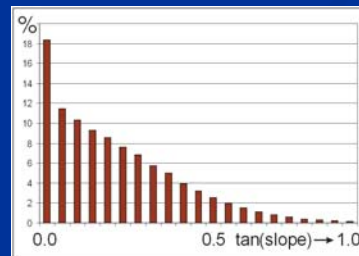


Figure 2-4: Frequency distribution of terrain inclination

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## STRATEGY

### Data

- Ikonos Imagery
- 1/1000 Scale Topographic Maps

In the Study, the data which are acquired from satellite images and cartography have been integrated to GE. On the first step; the high resolution (1m) image of American IKONOS satellite which covers the study area is used. Although Ikonos imagery has been commercially available since early 2000, the use of this imagery and especially the scientific investigations on its potential use in various applications have been restricted due to various reasons, related to the closed policy of Space Imaging (SI). The Ikonos image which is used in this study was taken in October 2002.

## STRATEGY

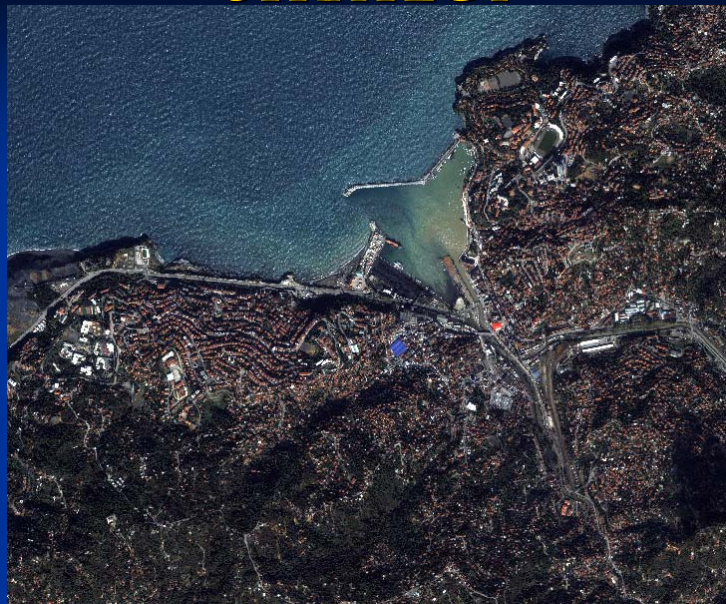
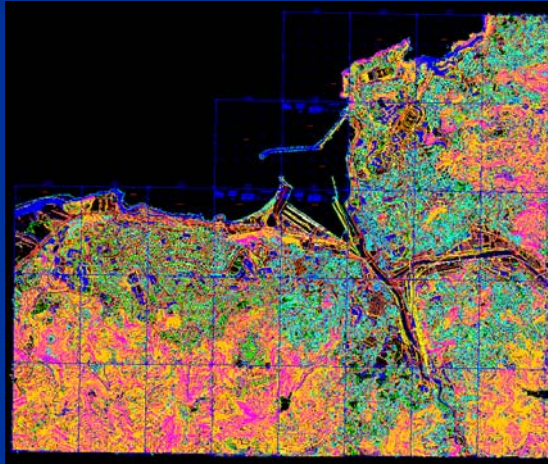


Figure : High resolution Ikonos image of the study area

## STRATEGY

### 1/1000 Scale Topographic Maps

1/1000 scale topographic maps have been used in the study to complete the needed database for GE. These maps have been acquired in 1997 by fotogrammetry.



## STRATEGY

### Programs

- PCI Geomatica V9.1.6
- NetCad 4.02
- Global Mapper V9.00

The program PCI Geomatica is used for geometric correction of high resolution satellite image Ikonos with using Ground Control Points (GCPs). After geometric corrections, PCI Geomatica is used for cutting the Ikonos image for superimpose with 1/1000 scale topographic maps coordinate limits.

In program NetCad 4.02, Ikonos image and 1/1000 scale topographic maps are superimposed, the details have been transferred from topographic maps to Ikonos Raster image and the export file has been transferred to DXF format for using in Program Global Mapper.

The program Global Mapper is used for transformation of the vector and raster data to GoolgleEarth format KMZ.

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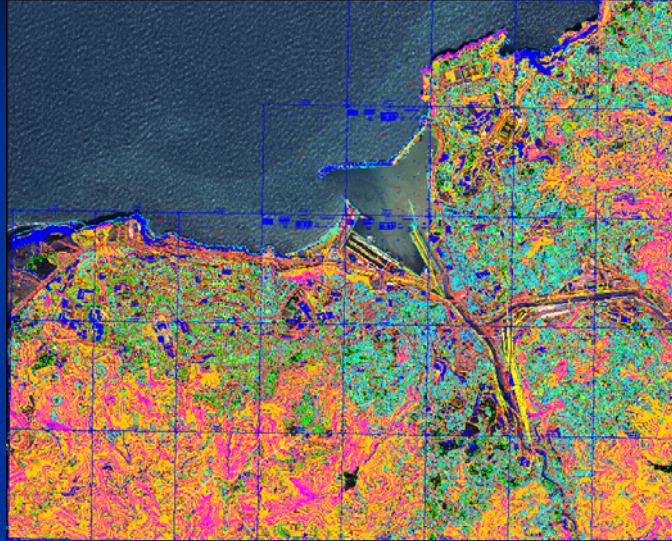
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## APPLICATION

In the application part of the study, firstly geometric corrections of high resolution Ikonos image has been made and the image is cut from the same frame coordinates with 1/1000 scale topographic maps. The coordinate system of 1/1000 scale topographic maps are ITRF96. Ikonos image has been cut from the limitation coordinates.

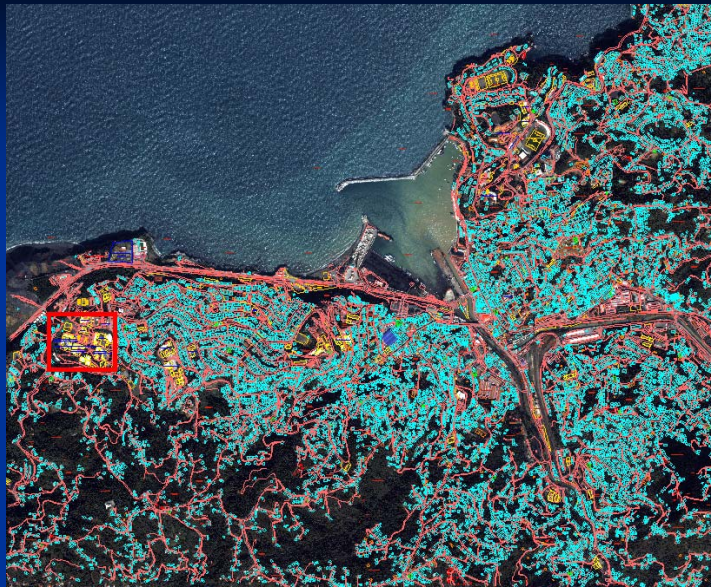
The high resolution Ikonos image has been opened in program NetCad 4.02 and the vectorization of the image is made by using the frame coordinates of the image. After the process, superimposition of the raster Ikonos image and 1/1000 scale topographic maps has been made. Figure shows the result of superimpose of high resolution Ikonos image and 1/1000 scale topographic maps of the study area.

## APPLICATION



Superimpose of Ikonos image and 1/1000 scale topographic maps

## APPLICATION



The buildings, official buildings, roads, touristic and historical places, accommodations, schools, sport centers and constructions of the study area Zonguldak

## APPLICATION

After the superimposition process in program NetCad 4.02, the vector and raster data have been transferred to DXF format for using in program Global Mapper. In Global Mapper, the file which has been transferred from NetCad 4.02 is opened in Universal Transverse Mercator(UTM) 36° in World Geodetic System of 1984 (WGS84) datum. The vector data from 1/1000 scale topographic maps and raster data from high resolution Ikonos imagery have been transferred into GE format 'KMZ' with using program Global Mapper. Figure shows an image from the transformation process level in Global Mapper.

At the end of the application, the output file in KMZ format has been superimposed to GE and the details which are wanted to see on the GE in the study area Zonguldak (the buildings, official buildings, roads, touristic and historical places, accomodations, schools, sport centers and constructions) have

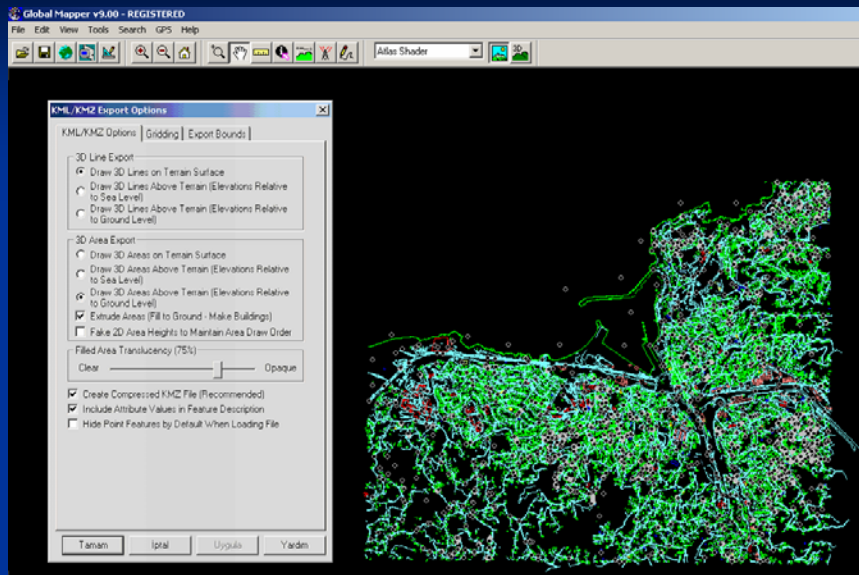
## APPLICATION



The Central Campus of University



# APPLICATION



The transformation process level in Global

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## CONCLUSIONS

Nowadays, GE and Virtual Earth technology very important a lot of users. Because, seeing 2D and 3D (some part of the world) of the world, finding address and a lot application is very easy for this technology. The enormous success of GE in integrating 2D satellite imagery into online mapping has demonstrated a massive impact of remote sensing on online mapping and brought remote sensing applications into our daily life.

## CONCLUSIONS

In this study, we were determined a requirement analysis for Zonguldak test field. Because there is no high resolution imagery and there is no detail information for Zonguldak in GE platform. After determining, we were georeferenced Ikonos imagery using PCI. Second step is Ikonos image and 1/1000 scale topographic maps are superimposed and change to DXF format. Finally, DXF raster and vector files were changed GE kmz format via using Global Mapper environment.

**THANK YOU FOR  
YOUR PATIENT**