



Determining Practically Temporal Coastline Changing in Trabzon

Ekrem SARALIOĞLU ,Recep NİŞANCI
and Bayram UZUN

Summary

Coastal areas have been attractive center for people since ancient times. This contribution is proportional to how well these areas are managed.



- Coastline detection and identification of temporal changes in coastal protection and management is important in order to maintain an appropriate manner.
- In this study, Trabzon province coastline is found as practically with Google Earth satellite images from 2002 to 2012.



XXV International Federation of Surveyors
Congress, Kuala Lumpur, Malaysia, 16 – 21 June
2014

Study Area

- Trabzon Province is determined study area.
- **Trabzon Province** is a province of Turkey on the Black Sea coast.

Trabzon Province Trabzon ili	
Province of Turkey	
<p>Location of Trabzon Province in Turkey</p>	
Country	Turkey
Region	Black Sea
Electoral district	Trabzon
Area	
• Total	6,685 km ² (2,581 sq mi)
Population (2010-12-31)^[1]	
• Total	763,714
• Density	110/km ² (300/sq mi)
Area code(s)	0462
Vehicle registration	61

XXV International Federation of Surveyors
Congress, Kuala Lumpur, Malaysia, 16 – 21 June
2014

Process Steps

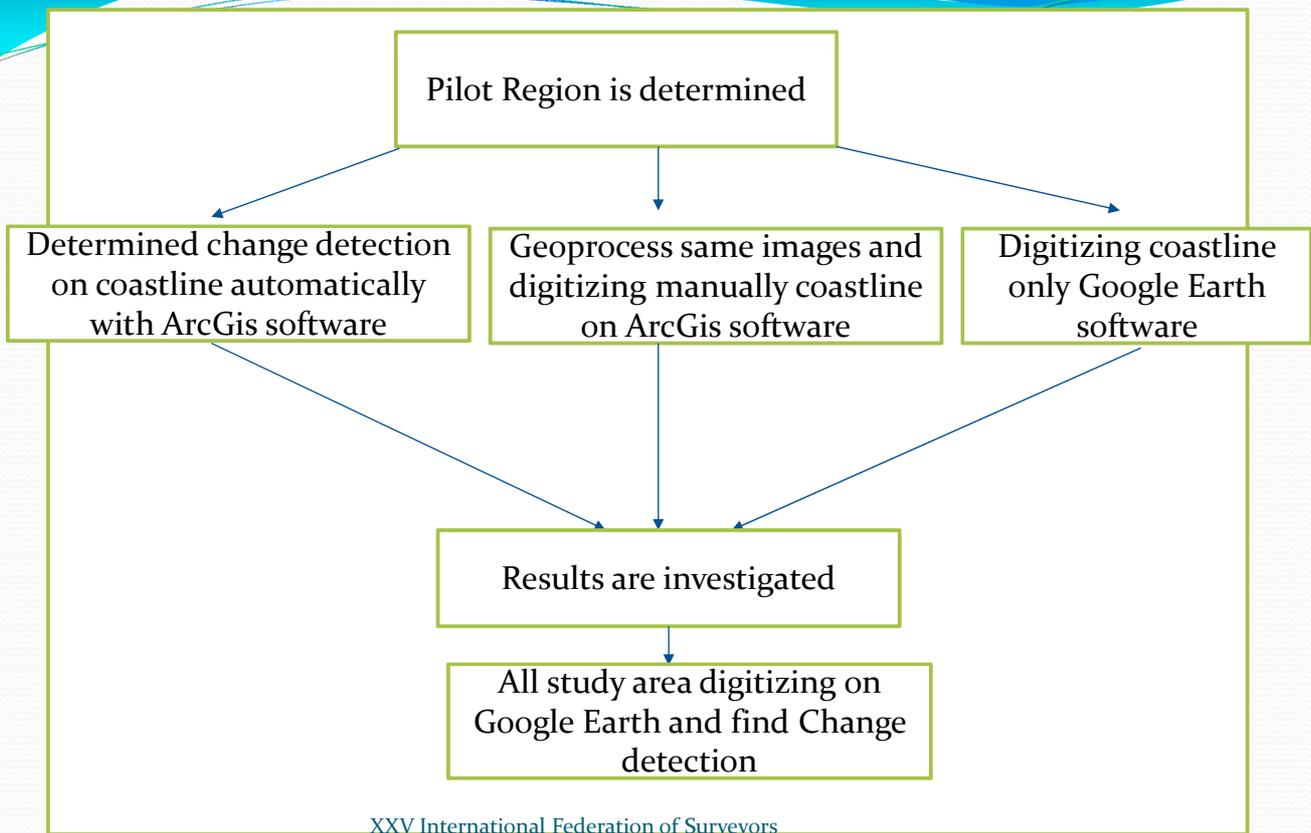
- 1. Method** Pilot region is determined and download images 2002 and 2012 from Google Earth software (image resolution is 4800*2718 pixel.)
 - Determined change detection on coastline with arcgis software image differencing algorithms.
 - Image geoprocessing
 - Histogram Equalize
 - Image Diferenceing
- 2. Method** Same images are opened ArcGis software and geoprocess images after than digitize coastline manually two images and find coastline detection.

XXV International Federation of Surveyors
Congress, Kuala Lumpur, Malaysia, 16 – 21 June
2014

- 3. Method** Digitizing coastline only Google Earth software and determined change detection.

- Results are investigated and all study area digitizing with Google earth software and determined change on coastline.

XXV International Federation of Surveyors
Congress, Kuala Lumpur, Malaysia, 16 – 21 June
2014



XXV International Federation of Surveyors
 Congress, Kuala Lumpur, Malaysia, 16 – 21 June
 2014

Studies

- Pilot region is determined.



- 2002 Google Image

- 2012 Google Image

XXV International Federation of Surveyors
 Congress, Kuala Lumpur, Malaysia, 16 – 21 June
 2014

1) Change Detection with Image Differencing

- Timely and accurate change detection of Earth's surface features is extremely important for understanding relationships and interactions between human and natural phenomena in order to promote better decision making. (D.Lu, P. Mmausel E. Brondi'z10 and E. Moran)
- Two Google Earth images open ArcGIS software and image analysis menu using and applied pixel based band differancing method.

XXV International Federation of Surveyors
Congress, Kuala Lumpur, Malaysia, 16 - 21 June
2014



2002



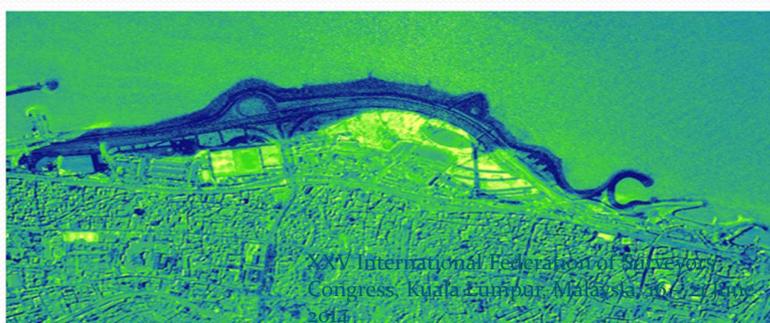
2012



2002 1.Band



2012 1.Band

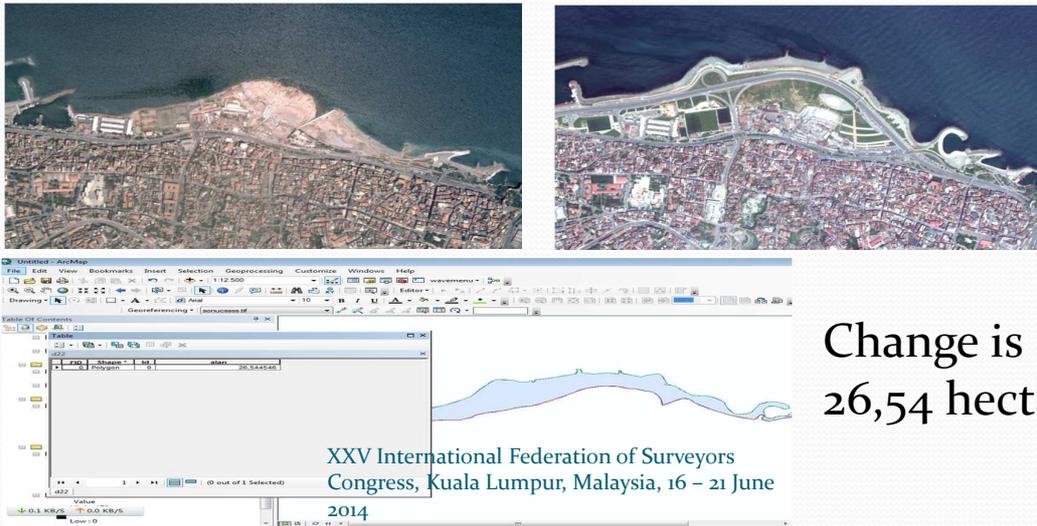


Blue areas show fill area
on the coast. Change is
26,40 hectares

XXV International Federation of Surveyors
Congress, Kuala Lumpur, Malaysia, 16 - 21 June
2014

2) Change Detection with Digitizing Registered Google Earth image

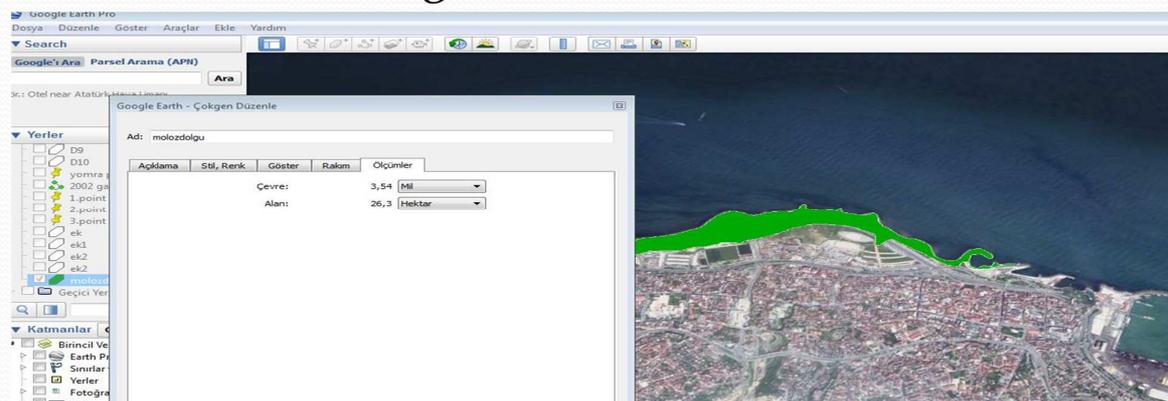
- Registered same image coastline 2002 and 2012 digitizing manually ArcGIS software and find change of coastline.



Change is
26,54 hectares

3) Change Detection with Using Only Google Earth Software

- Google Earth software include different times satellite images.
- Cost line digitizing two image online Google Earth software and change area are detected.



Change is 26,3 hectares

XXV International Federation of Surveyors
Congress, Kuala Lumpur, Malaysia, 16 - 21 June
2014

Study	Change
1 Change Detection with Image Differencing	26,40 ha
2 Change Detection with digitizing registered image	26,54 ha
3 Chang Detection with Google Earth	26,3 ha

Trabzon Province Coastline Change Detection

Final Trabzon province digitizing Google Earth and change detection determined.



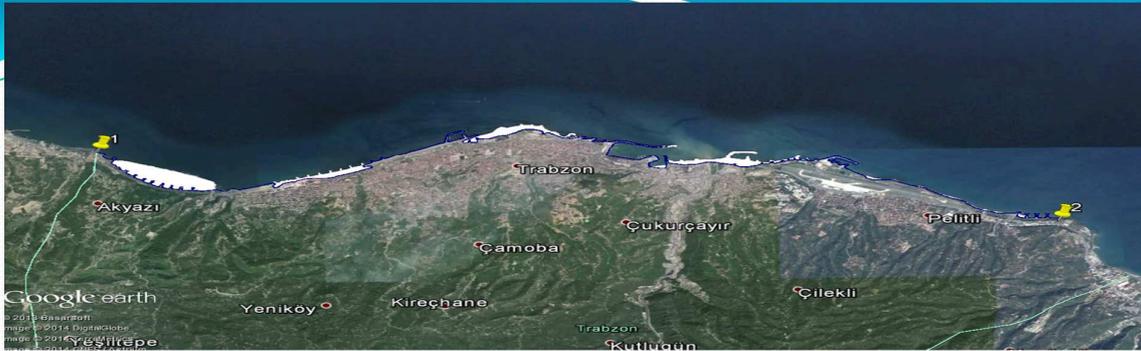
Trabzon Akyazi-Pelitli



Digitizing 2012 image using Google EARTH software



Digitizing 2002 image using Google EARTH software



Final Map
Change is 156,56 hectares



Conclusion

- Google Earth software including temporal satellite images.
- We can make same basic analysis and query on program.
- Images are geoprocesed and coordinates on program so users dont need to geoprocesing steps.
- The software is free.
- This method is userfriend,free and easy.
- Consequently we can determined change detection easily on coast line and fill area on Google Earth software.



With the hope of meeting at Turkey for FIG 2018

XXV International Federation of Surveyors
Congress, Kuala Lumpur, Malaysia, 16 – 21 June
2014

Thank you for your attention