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Full Length Research Paper

Determination of the parcels committing coastal contravention via the geographical information systems: Sample of Samsun

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It is clearly stated in the Constitution and Civil Law, being in the first place, and in Municipal Law, Cadastral Law and Coastal Law that the coasts are under the provision and austerity of the government and that public interest shall be pursued for benefiting from these areas. In the 715 article of the Law, 16/c article of the Cadastral Law and 79 article of the Municipal Law, it is specified that private ownership can not be in question on the coasts and those areas can not be suspended. Additionally, in accordance with the 5th article of the Coast law, numbered 3621/3830, the determination of the shore border line is compulsory in order to perform planning and application on the coastal and shore line. Since the available real estates on the coastal areas are very significant, where public interest shall be given particular importance, determination and plannings of the shore border line shall be made very carefully. However, due to precipitation and since the determination of the shore border line is not performed as it should be and in time, utilizations outside of public interest are seen. The first and the most important step of our country concerning protecting the coasts of seas, lakes and rivers and shores which are follow-up of these is the determination of the shore border line. In this study, different areas were determined in the district of Atakum and its towns on the western shores of the province of Samsun and the relationships of the shore border line-landownership were examined in the given areas. In order to make researches and examinations in these areas, primarily; cadastre sheets were supplied from the Cadastral Directorate, landownership information related to the real estates were supplied from the Real Estate Registration Offices and determinations of the shore border line were supplied from the Provincial Directorates of Public Works. Digitizing the acquired data, softwares of the geographical information systems and data which were kept on different layers could be superposed, shore border line was processed onto the status of landownership and the relationships of the shore border line-landownership were examined through making the required spatial analysis and inquisitions. In the examinations, the extents of the shore border line contravension were calculated for the parcels in which the shore border line passes through the landownership border. The examinations here were performed by taking the determination dates of cadastre and shore border line into consideration, as well. Additionally, geological characteristics in the study area were determined appropriately for the parcels which would not be subject to the private land ownership since they are within the shore border line and which were required for the Title Cancellation. As a result of the sieve analysis performed in the research area, geological structure was determined to be sand and sand full of shells.

Key words: Coast, shore border line, landownership, cadastre, geographical information systems, coastal contravention.

INTRODUCTION

In the 43. article of the Constitution Law, it would be possible to take precautions that would enable the usage of the shore which is tried to be assured for the public interest and then put them into practice. However, the

facilities of infrastructure and superstructure, which complete the usage manner of the area, shall be provided for decision makers and users for this and this is completely about the management of the coast (Ünal, 1997). Management of the spatial information have gained importance in all the worldwide studies for the decision-maker authorities and planners, the necessity of establishing a spatial data infrastructure arose for the control of natural sources and environmental changes. As a result of this, usage of developing information technologies such as geographical information systems (GIS) came into prominence. Since GIS enables the analysis of the space-based data and information by means of visual and analytical tools after being processed and interactive use of information by the user, it had become more than a computer program and an effective system that could be used in problem solving.

Coastal areas management is described as a constant, precautious and adapted source management process for a sustainable development in the coastal areas. Sustaining the sustainable life within the triangle of nature, environment and creatures as a whole, determining and removing or minimizing the pollutive resources could be possible through GIS (Alkiş, 1997; Kay and Alder, 1999). GIS is an information system which executes the functions of collecting, hiding, processing the graphic-nongraphic information which are obtained through space-based observations and presenting them to the user as a whole (Yomralioğlu, 2000). As well as its common usage on territorial studies, it has become a necessary tool for the management and planning of coastal and sea areas which have recently gained importance (Uçkaç, 1998; Keenan, 1998; Sesli, 2010).

The use of the GIS technology in the coastal management could be considered as an extended field. With the help of this system which can manage the spatial information efficiently, the process of decision-making could be supported (Sesli et al., 2003). Developments within the GIS systems enabled the access to the functions to extend to personal computers or internet users. GIS provides a mechanism for storing, analysing, using and displaying the geographical-based information (Aydinoğlu and Yomralioğlu, 2002).

In this study, areas of investigation were determined in the district of Atakum and its towns on the western shores of the province of Samsun, the relationships of the shore border line-landownership were examined in the given areas and making the required spatial analysis and investigations, the extents of the shore border line contravension were calculated for the parcels in which the shore border line passes through the landownership border.

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DEFINITIONS ABOUT COASTAL AREAS AND COASTAL LEGISLATION IN TURKEY

According to the Coastal Law numbered 3621/3830;

Coastline

It is a natural line on the sea, lakes and rivers that changes due to some meteorological events which is formed by the fusion of the points on which the water touch the earth on the positions other than flood.

Shore border line

It is a natural border of sandy, gravel, rocky, marsh, rushy, and other similar areas formed by the water motions against the earth after the coast line of sea, lakes and rivers. This border can not be changed even though sea is filled to obtain land.

Coast

This is an area between coast and shore border line.

Shore buffer zone

It is an area of at least 100 m with horizontally from the shore border line of sea, lakes and rivers to earth.

The detection of a sash as shore buffer zone especially in the developing countries, aims to prevent from coastal erosions, to provide public reach to the coast and to be open to coastal view (Sorensen, 1995). According to the article 43 of the Constitution Law of Turkish Republic, the coasts are at the disposal of the government. In utilizing from the sea, lake and river coastlines one must take care of first of all the public benefit. According to the 2001 date Turkish Civil Law, the places with no property and the goods in the benefit of the public are in no ones landownership and can never be a subject of a private landownership. According to the Coastal Law numbered 3621/3830, the detection of the shore border line is obligatory to be able to make plans and plan's implementation on the coast and shore buffer zone. But unfortunately, the usage out of public benefit is being seen because of the agitated in planning and the detection of shore border line not in the way or at the time it must be done (Sonmez, 2002).

EXAMINING THE COASTAL STUDIES OF THE PROVINCE OF SAMSUN

In this study, firstly the available shore border line determinations were studied in order to determine the shore border lines in the province of Samsun and assess their relations with landownership. In this context, information related to the shore border line determinations which have been performed for seashores until today are given in Table 1.

As it is seen in Table 1, shore border line of a 107 km part was determined in Samsun which has a coastal length of 208 km in total, however the shore border line of the 101 km part has not been determined yet.

Table 1. Shore border line determinations of the province of Samsun.

For seacoasts				
District	**Shore length (km)**	**Shore border line determination is performed (km)**	**Shore length which is supposed to be implemented with shore border line determination (km)**	**Accruing rate (%)**
Yakakent	14.68	7.96	6.72	54
Alaçam	18.10	5.30	12.80	29
Bafra	35.00	5.00	30.00	14
19 Mayis	21.42	20.26	1.16	95
City Center	31.48	31.48	0.00	100
Tekkeköy	10.29	10.29	0.00	100
Çarşamba	34.70	10.95	23.75	32
Terme	42.60	15.80	26.80	37
Ayvacik	0.00	0.00	0.00	0
Ladik	0.00	0.00	0.00	0
Vezirköprü	0.00	0.00	0.00	0
Total	208.27	107.04	101.23	51

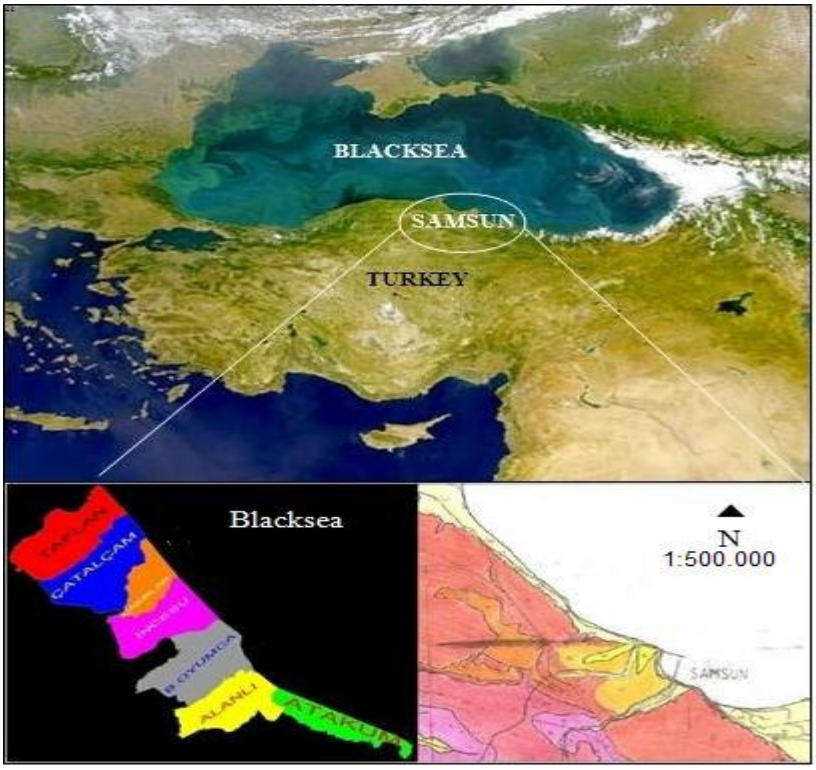

Figure 1. Study area and geological map.

Choosing and describing the study area

A coastal department of 16 km, including the towns of Taflan, Çatalçam, Çakirlar, İncesu, Büyükoyumca, Alanli, Atakum from the town of Atakum on the western shore of the province of Samsun, was determined as the study area (Figure 1).

Obtaining the data and bases concerning the study area

In order to make the required researches in the study area, first of all; 1/1000 scaled cadastre sheets which are based on the country coordinate system of the given areas were obtained from the Provincial Directorate of Cadastre, 1/1000 scaled topographical

Table 2. Total contravention amounts on the basis of towns.

Name of the town	Number of parcels committing shore border line contravention	Amount of shore border line contravention (m²)
Taflan	41	1142.73
Çatalçam	11	2286.08
Çakirlar	17	23408.21
İncesu	38	7309.75
Büyükoyumca	37	3784.40
Alanli	14	2333.21
Atakum	6	122.43
Total	164	40386.81

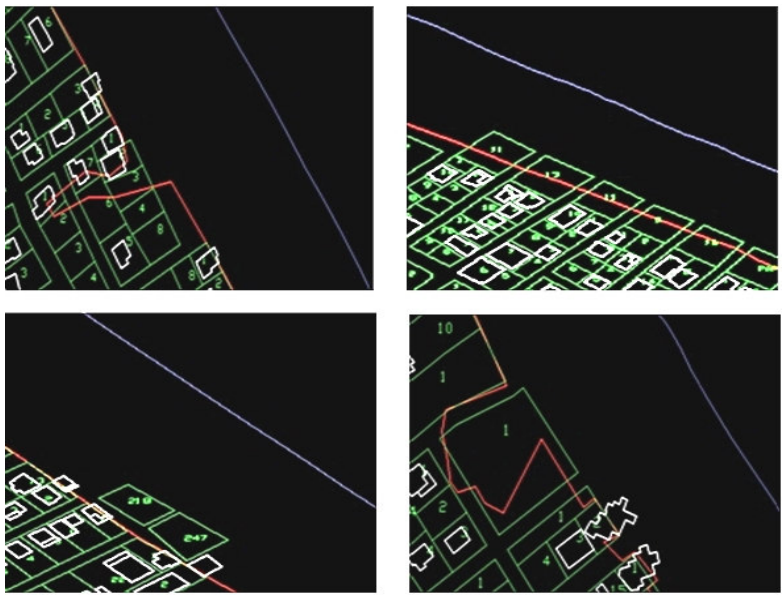

Figure 2. Examples to parcels committing shore border line contravention.

maps which had previously been converted from the site zoning coordinate system into country coordinate system were obtained from the Directorate of Provincial Bank, 1/1000 scaled, current sheets which are based on the country coordinate system and depicts the verified shore border line were obtained from the Provincial Directorate of Public Works and landownership, information were obtained from the local real estate registration office. A part of these data was obtained within the digital environment and the rest was obtained as sheets. Non-digital data were digitized by NetCAD 5.0 GIS software after being scanned as 1200 dpi.

DETERMINATION OF THE LANDOWNERSHIP ON THE COAST

Cadastre sheets which were obtained digitally on the country coordinate system, topographical maps and sheets depicting the shore border line were digitally superposed with the help of the NetCAD 5.0 GIS software, topology was established, contravention amounts of the real estates whose parcel borders are on the coastal direction of the shore border line and which, therefore, commit a contravention of shore border line were determined and these amounts are given separately in Table 2 for different towns in the chosen study area.

As shown in Table 2, totally 164 parcels having shore border line contravention were determined in the study area and the total amount of the shore border line contravention of these parcels was determined to be 40386.81 m² (40 acres). Taking the contravention amounts into consideration, Town of Çakirlar is placed on the top with a contravention amount of 23408.21 m². Examples are given for parcels committing contravention in Figure 2.

Additionally, within the context of the study, utilizing the land registrations of the parcels subject to contravention, their landlords were provided, making the required spatial analysis and investigations, landlords of the parcels committing shore border line were determined and it is summarized in Table 3.

Examining Table 3 in relation with the parcels having shore border line contravention, in other words being on the coast and requiring the process of title cancellation, contraventions related to the parcels of the persons are placed on the top, in terms of both

Table 3. Landownership distribution of parcels within shore border line.

Owner of the parcel committing contravention	Number of the parcels committing contravention	Rate (%)	Amount of shore border line contravention (m²)	Rate (%)
Finance treasury	5	3.05	289.78	0.72
Person	151	92.07	39921.73	98.85
Municipality	2	1.22	25.78	0.06
Company	4	2.44	88.90	0.22
Public establishment	2	1.22	60.62	0.15
Total	164	100	40386.81	100

Table 4. Geological structure of the parcels committing shore contravention.

Name of the Town	Square/ parcel no.	Landowner	Acreage of the parcel (m^2)	Amount of shore border line contravention (m^2)	According to USCS
Taflan	2487/11	Real person	4083.67	182.41	SM
Çatalçam	868/1	Real person	2005.14	1476.40	SM
Çakirlar	313/950	Real person	2715.24	2534.76	SM
Incesu	2990/277	Real person	622.74	622.74	SM
Büyükoyumca	1633/52	Real person	1796.92	1051.47	SM, andesite basalt, tuff, agglomerate
Alanli	1538/11	Real person	892.57	545.22	SM
Atakum	469/1	Company	1222.30	33.15	SM

the number rate (92.07%) and square rate (98.85%).

DETERMINATION OF GEOLOGICAL CHARACTERISTICS OF THE PARCELS ON THE COAST

In the study, each one of the parcels committing shore border line contravention on each town was determined, the method of sieve analysis (USCS) was applied for the disturbed samples which were taken with the method of legitimate geotechnical Trial pit and results related to the sample are given in Table 4.

Results of laboratory investigations performed on the disturbed samples which were taken from the investigations carried out with the method of Trial pit on the field are given in Table 4. SM (silty sand) was found on the coasts of Büyükoyumca and round-edged andesites and basalts of 5-15 cm diameter were observed on a band of approximately 400 m, belonging to Tekkeköy Formation. This area shows the characteristic of a narrow shore. Besides, creatures from the classes of Pelecypoda and Gastropoda, which mainly reside in the seas, were also observed on the samples taken during the field investigations. Examining the given Table, it is determined that parcels are being contravened since they are within the coastal area as from the shore border line and that they are supposed to leave these areas for the public weal.

RESULTS AND DISCUSSION

Examining the shore border line determinations carried out on the coasts of Samsun and their relation with landownership; it is seen that shore border line determinations have not been completed provincial-wide, according to the determinations performed, a large number of real estates are left on the coast, due to being on the coast, the processes in question could not have been started for the real estates which require title cancellation, additionally, there are some discussions concerning the compliance of the determinations in question with scientific data in some regions where shore border line determination had previously been carried out.

In the short term, since landownership is out of question on the coast, parcel contraventions shall be removed and contravention amounts shall be left off-registration and these areas shall be left for the public weal, additionally shore border line shall be cleared of unlicensed construction and construction overflow in the direction of the coastal line by the persons, protecting the areas which are not lost yet and saving the areas which are contravened shall be the main objective, in the long term, contradictions related to the law and regulations shall be removed, shore border line shall immediately be conveyed on all coasts and landownership limit and legal status shall be clarified as soon as possible, authorizations and missions shall be determined clearly by performing legislation regulation in order to simplify the applications on the coasts, and studies shall be started as early as possible in order to establish a system that would solve the determination problems with an integrated approach.

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