INTRODUCTION
Gokova Bay located at the southwestern Turkey is among the major tourist resort areas. Sustainable tourist development is based on a great extend on the availability of fresh water which is mainly supplied by karstic limestone aquifers. Further, the area is known for elaborate geological structures and karst features. The influence of tectonic activity and the mechanism of fresh water intrusion by sea water has been investigated by means of hydrogeochemical and environmental isotopic techniques.

CLIMATE & DRAINAGE PATTERN
Climate is of Mediterranean type with hot and dry summers and mild and wet winters. Most of the precipitation is in the form of rain, but sporadic snowfall is also observed at the peak areas extending over 1000m. Based on 50 years meteorological records the mean annual precipitation is 1185 mm. Mean annual temperature is 14.8 °C, and the minimum and maximum temperatures are 28.1 °C and 2.4 °C, respectively. Relative humidity is about 56%. Dominant wind direction is WNW-NW and the length of the sunny days are 8.5 months.

Almost all of the precipitation is drained by the carbonate formations as implied by the presence of a poorly-developed drainage pattern and scarcity of perennial stream. All perennial streams, through their discharge is limited to a few lisse are located over impermeable formations. The main groundwater flow direction at the plateau (i.e. in the northern part) is from north to south. It is inferred that the precipitation in the plateau part infiltrates rapidly into the deeper parts of the carbonate aquifers where it gets concentrated around the fault lines and is conveyed towards coastal part.

Throughout the aquifer system, groundwater flow is controlled by tectonic structures. All springs are located along the fault lines or at their intersections.

INFERRING AQUIFER ROCK BY MEANS OF SR/SR DATA:
The "Sr/Sr" ratio of the marine carbonate rocks are assumed to be identical to that of seawater at the time of their deposition if the following situations did not happened: alteration of rocks after diagenesis, dedolomitization inaccurate age assignments or, high amplitude and short period variation of the oceanic "Sr/Sr" ratio (Faure, 1986).

The variation of "Sr/Sr" ratio of the oceans during Phanerozoic time is given in the figure which is based on the data of Berner et al. (1982). Because of the reasons mentioned above "Sr/Sr" ratio of the groundwater should be identical to the "Sr/Sr" ratio of the aquifer rock if there is no other source of Sr.

Limited number of samples have been analysed for the Sr isotopic ratio contents in this study. These are GK-14 Sea water, GK-15 Baýyaka plateau spring which is not affected by seawater, and three coastal springs that were affected by seawater in different rates (GK-3 Cennet Restaurant, GK-7 Deniz Restaurant II and GK-9 Akbük). Sea water effects were substracted from measured "Sr/Sr" ratio of the groundwater samples and remaining sample contents were compared with those of aquifer rocks. Hydrogeochemical map points out that all springs analysed for "Sr/Sr" ratio are in contact with autochthonous and allochthonous units. Most of the groundwaters are in contact with the Triassic-Middle Jurassic limestone and dolomite, Tertiary conglomerate except the spring numbered GK-13 Baýyaka which is in contact with the Silurian Permiann schistts (see Table 4).

Final conclusions for Sr isotope ratios are made as follows:
GK-3 Cennet Restaurant is recharge by Triassic-Middle Jurassic aged Gereme formation and Tertiary aged Koprucay formation;
GK-7 Deniz Restaurant II springs aquifer rock is Tertiary aged Koprucay formation;
GK-12 Yeniköy is fed by Mesosopic Yilani formation;
GK-9 Akbük spring’s aquifer rock is Gereme formation and sandy clayey layers of Tertiary Yilani formation;

Sea water sample from the Gokova Bay is diluted by freshwater, thus "Sr/Sr" ratio of this sample lower than the standard ocean water’s value given by Faure (1983) as 0.70912.

HYDROGEOCHEMISTRY
Springs, wells and seawater have been surveyed for chemical composition variations for a period of five years. Regional hydrogeochemistry comprises of three chemically distinct type of waters, namely two end members, sea water and fresh karstic ground water and the mixture of these two. Fresh karstic ground water and sea water are characterized by Ca-HCO3 and Na-CI facieses, respectively. Mixture waters usually belong to the part of Na-CI facies close to Ca-CI facies. Fresh karstic groundwater (samples 12, 13 and 15) discharging at high altitudes (in the plateau part) are located in the Ca-HCO3 region. Well in Gokova coastal plain (16 A and B) discharges also fresh water from a buried stream channel. Although located nearby the sea, artesian flow conditions dominating in this part of the Hellenic shelf limits the extend of sea water intrusion. Specific conductivity measured in these wells is slightly higher than those of plateau springs and varies around 750 microS/cm.

Since sea water in the Gokova Bay (14) is mixed with fresh water, two more sea water samples (17 and 18) have been collected to represent original sea water. These are plotted on the two dimensional Piper’s diagram. Other sampling sites located to the north of Gokova Plain and along the northern coast line are plotted between sea water (14, 17, 19) and fresh water (plateau springs; 11, 12 and wells in Gokova Plain; 16 A and 16B). Depending on the amount of sea water contributed, some waters (coastal springs) are located close to sea water, whereas, the springs in plain are located closer to the wells in the Plain. The calculated sea water contribution rates are given in the Table.

CONCLUSIONS
Sea water contribution calculated by Cl content increases toward west along the coast line in the Gokova plain groundwater basin. The seawater at the eastern end of Gokova Bay is diluted by freshwater discharges, and consequently exhibits a seawater contribution rate of 74% suggesting that 26% of seawater is freshwater origin. Groundwater water samples collected from other sites have contribution rates between 1% and 17%.

As the seawater contribution increase, the error on the recharge elevation estimated from O data increases. This is clearly seen on GK-9 Akbük, GK-10-A and B sampling points which have the highest seawater contribution rates among the others. Calculated elevations after substracting the seawater contributions provided plausible results.

87Sr/86Sr ratio of groundwater was proven to be a useful to estimate the sea water contribution rate and to infer potential aquifer rock(s).