



## **Teaching of the subject “density difference caused by salinity”, one of the reasons that plays role in the occurrence of currents in straits, seas and oceans by the use of a teaching material**

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Large masses of moving water in seas and oceans are called currents. Root causes of currents are steady winds that occur due to the global atmospheric system and the density differences caused by different heat and salinity levels of water masses. Different feeding and evaporation characteristics of seas and oceans result in salinity and density levels. As a result, subsurface currents occur in straits where seas with different salinity and density levels meet and in the nearby seas. The Bosphorus in Istanbul where I live and the school I am working at is has these subsurface currents.

In the Black Sea where the rivers the Danube, Dnieper, Don, Yesilirmak, Kizilirmak and Sakarya flow into and the evaporation level is less due to the latitude effect, salinity level is less compared to Marmara and Aegean Seas. As Marmara Sea has higher salt amount than Black Sea, there is a great density difference between these two seas. Marmara Sea has a higher concentration of salt and therefore a higher density than Black Sea. And this leads to occurrence of subsurface currents in the Bosphorus.

I get my students to carry out a small demonstration to help them understand the occurrence of ocean currents and currents in the seas and the Bosphorus by the use of a material. We need very simple materials to carry out this demonstration. These are an aquarium, a bowl, water, salt, dye and a mixer. The demonstration is carried out as follows: we put water, salt and dye in the bowl and mix it well. The salt will increase the density of the water and the dye will help distinguish the salty water. Then we put tap water half way to the aquarium and pour the mixture in the bowl to the aquarium slowly. As a result, the colored salty water sinks down due to its higher density, setting an example of a subsurface current.

Natural events occur in very long periods by great dynamic systems, making understanding of them difficult. It is important to use different kinds of materials that address to different senses in geography lessons to promote effective and fun learning. Thus, geography lessons should be based on teaching principles such as ‘from concrete to abstract’ and ‘from near-to-far’ principles. Also, teaching methods such as visualization, simulation and experiment should be applied during the lessons.

The use of this material will help students comprehend how subsurface currents in the straits, seas and oceans occur. By this simple experiment, students will be able to see what kind of a movement takes place under the Bosphorus on which they travel by ferry and they will have the opportunity to carry it out themselves, making the lesson more fun.