

كلية العلوم

القسم : الفيزياء

السنة : الثانية



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المادة : لغة تخصصية ٢

المحاضرة التاسعة/نظري/

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يمكنكم طلب المحاضرات برسالة نصية (SMS) أو عبر (What's app-Telegram) على الرقم 0931497960



# ***Session 9***

## ***What are ocean currents ?***

The oceans contain streamlike movement of water called ocean current . Ocean current that occur at or near of surface of ocean , caused by wind , are called surface currents . Most ocean currents reach depth of about 100 m , but some go deeper . surface currents reach lengths of several thousand kilometers and can stretch across ocean . An example of a surface currents is a gulf stream . The gulf stream is one of the strongest ocean

currents on earth . The golf stream transports , or moves , more water each year than is transported by all the rivers in the world combined .

### ***What affects the ocean currents ?***

Surface currents are affected by three factors : continental deflections , the coriolis effect , and the global winds . These factors keep surface currents flowing in distinct patterns around earth .

***Continental Deflections :*** If earth surface was covered only with water , surface currents would simply travel continually in one direction . However , water does not cover the entire surface

of Earth . Continents rise above sea level over about one - third of earth`s surface . When surface currents meet continents , the currents are deflected and change directions . For example , the south equatorial currents turns southward as it meets the coast of south America .

***The Coriolis Effect*** : Earth`s rotation causes all wind and ocean currents , except on the equator , to be deflected from the paths they would take if the earth did not rotate .The deflection of moving objects from the straight path due the Earth`s rotation is called the coriolis effect . Earth is spherical , so Earth`s circumference at latitudes above

and below the equator is shorter than the circumference at the equator . But the period of rotation is always 24 hours . therefore , points on earth near the equator travel faster than points closer the poles . The differences in speed of rotation causes the coriolis effect . For example , wind and water travelling south from the North Pole actually go toward the southwest instead of straight south . Wind and water deflect to the right because the wind and water move east more slowly than earth rotates beneath them . In the northern Hemisphere , currents are deflected to the right .In the southern Hemisphere , currents are deflected to the left . The

coriolis effect is most noticeable for objects that travel over long distances , without any interruptions . Over short distances , the difference in Earth`s rotational speed from one point to another is not great enough to cause noticeable deflection .

### ***Global Winds***

Winds that blow across the surface of earth`s ocean push water across earth`s surface . This process causes surface currents in ocean . Different winds cause currents to flow in different directions . For example , near the equator , the wind blow east to west for the most part . Most surface currents in the same area follow a similar pattern .

## ***What powers surface currents ?***

The rising of warm air creates an area of low pressure near the equator .Pressure differences in the atmosphere cause the wind to form . So the sun causes winds to form , and winds cause surface currents to form .



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