

Atlantic conveyor belt system



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The Atlantic Conveyor Belt System The Atlantic conveyor belt system was observed by scientists to have sped up the water circulation in the past years (NASA/Jet Propulsion Laboratory 2010). The Atlantic conveyor belt, which is also termed Thermohaline circulation, is one of the major ocean currents driven by fluxes of heat and freshwater across the sea surface and the subsequent mixing of heat and salt (Rahmstorf 2006). The ocean water circulation occurs globally due to the influence of established geophysical factors. The Atlantic conveyor belt system influences the global climate and probable changes in the speed of overturning circulation poses adverse effects.

In detailed, ocean waters circulate around the world in patterns due to factors including the differences in solar energy received by the equator and the poles, topography of the ocean floor and coastal land masses, changes in seawater density, rotation of Earth around its axis, and atmospheric winds. The pattern of the Atlantic conveyor belt is the northward flow of warm surface waters from the Caribbean along the Atlantic coast of the United States, known as the Gulf Stream. As the warm waters reach the North Atlantic, it becomes denser due to the lowering of temperature, and becomes more saline from the evaporation of surface water and formation of ice. Denser water sinks forming a cold bottom current in the Atlantic. The current then circulates to the south towards Antarctica and turn eastward. By passing across the equator, the water becomes warm, rises to the surface and veers westward towards the Atlantic Ocean (Bloom 2011).

Moreover, the Scientists of the National Aeronotics Space Administration once suspected that the speed of the Atlantic conveyor belt has slowed down. However, using recent measurements of the Atlantic Meridional

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Overturning Circulation show no significant slowing of overturning over the past 15 years (NASA/Jet Propulsion Laboratory, 2010). On the contrary, it was found out that water circulation had sped up about 20 percent from 1993 to 2009 (NASA/Jet Propulsion Laboratory 2010).

The circulation of the Atlantic Ocean is very important in the climate system. The warm currents contribute to the higher average temperatures of about 5°C in the East Coast of the United States, Europe, and Scandinavia compared to other land masses along the same latitude (Bloom 2011). In general, warm currents transport energy from the tropics to the sub polar North Atlantic. It also influences weather and climate patterns. Cold currents facilitate the transfer of carbon from the atmosphere to deeper water depths (Universitat Autònoma de Barcelona 2010). The effect of global warming on Atlantic conveyor belt is viewed in two ways - the surface warming and surface freshening. Disruptions of the process of the Atlantic conveyor belt would greatly affect marine ecosystems.

Overall, the Atlantic conveyor belt system is very important in maintaining the earth's equilibrium. The distinct water current pattern is the synergistic effect of the different environmental factors. Changes in the geophysical state of the earth such as global warming would lead to the Atlantic conveyor belt system to collapse.

References:

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