Global warming effect on climate of western europe essay

Business

A case study of global warming effect on the climate of Western Europe.

Massive amounts of water move in the ocean currents, transporting warmth, nutrients and animal life through thousands of miles. Some of the currents warm entire continents, bringing life to regions that would otherwise be locked in constant arctic cold. Others carry food for wildlife, contributing to rich and productive ecology. To understand the enormous power of these currents, consider that in a single hour, the Antarctic Circumpolar current, one of the planet’s largest, moves over 450 billion tons of water. And even the ocean’s smallest currents may move more water than the entire continent’s rivers combined. The ocean currents draw their power from a combination of the wind on the sea and the difference between the densities of various types of water. Currents near the surface are generally powered by the wind. Because of the Earth’s rotation, winds tend to drive currents clockwise in the northern hemisphere.

South of the equator, they flow in the opposite direction. Deep below the surface, difference in water temperature and salinity propel the deep-sea currents that bind the world’s oceans together. Some of ocean currents are only a few miles long, and others extend over thousands of miles and encompass vast areas of water. Some are cut short by landmasses, and others take detours around islands.

Only the Antarctic Circumpolar current flows all the way around the Earth uninterrupted. For at least 25 million years, the Antarctic Circumpolar current has helped insulate the waters around Antarctica from other oceans. The current helps keep warmer waters away from the continent. Ocean

currents help transport heat and cold, playing a key role in the Earth’s climate. There is therefore a need for data, so that the scientist may keep track of the currents strength, natural variation and any alterations that may arise as a result of the climate change.

A project called Argo, launched by the researches at the University of California in San Diego (UCSD), now supported by over 50 agencies from around the world has been involved in continuous measurement of the world’s oceans. Beginning in 2000, Argo researches have begun launching floats to collect samples from the water columns in all the major ocean regions: Pacific, North Atlantic, South Atlantic, Indian, and Southern. As of last year, more than 3, 300 floats have been launched collecting data on salinity, temperature and currents in the top 6, 500 feet of a water column. Every 10 days a float drops to a depth of 6, 500 feet, then slowly rises to the surface and transmits the data it recorded to a satellite.

That data is available on the project’s website for use by scientists at universities, government agencies and meteorological centers. It’s known that currents may influence climate, but remains unclear to what extent changes in atmospheric conditions will affect currents, in turn causing further climate changes. The Gulf Stream has a great impact on an entire region’s climate. It begins as a minor current in the Gulf of Mexico but picks up more water along the way, eventually becoming one of the world’s largest and powerful ocean currents, pushing 13 trillion tons of water toward Western Europe daily. This water releases its warmth into the atmosphere as it travels, making Western Europe, several degrees warmer than other regions

at the same latitude. Winters, in particular, are surprisingly mild there, thanks to the heat generated by the Gulf Stream. Even though scientists have known for almost 50 years that the Gulf Stream transports heat, they’re still making discoveries about the way it affects the weather. Last year, the research team led by Shoshiro Minobe of Hokkaido University in Japan to an important step forward.

They discovered that the warm water releases its heat not the lower 6, 000 feet of the atmosphere, as had been believed, but into almost the entire troposphere – the section of the atmosphere where the weather is warmed. Nature, agriculture, fisheries – all sources of food and livelihood for many millions of people in a densely populated Western Europe depend on the life-giving warmth of the Gulf Stream. Many a researchers are, therefore, concerned the global climate change could slow work. The first their concerns are focused on the phenomenon call from a thermohaline circulation: a slow, constant movement of the ocean’s waters, powered by differences in water temperature and salinity.

The Gulf Stream is particularly driven thermohaline circulation in the North Atlantic, where water cools so much as it approaches the highest latitudes that it sinks – cold water is more dense than warm water – and then flows south toward the equator. Meanwhile, the less dense water flows more over the cold water replace it presently. This warm water cools and begins flowing south, and the cycle continues. For years scientists speculated that the melting of icebergs in the Atlantic caused by global warming will result in the influx of fresh water into the North Atlantic. Because freshwater is less dense

than saltwater, this will lower the density of the North Atlantic to the point where the surface waters can never be cooled enough to sink and start their southward journey.

This would effectively halt the thermohaline circulation and, according to the most severe hypothesis, halt the Gulf Stream itself. The close connection between climate and the currents is only beginning to reveal itself. With more comprehensive data from efforts like the Argo project, researchers could someday have the information they need to make predictions about the future of our planet’s entire surface, rather than just watching on the shore.