Global Weather 6

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## **Motions of the Oceans – Ocean Currents:**

-An **oceanographer** is a scientist that **studies ocean currents**.

-Ocean currents are compared to **large conveyor belts that move around the globe**.

-The ocean currents circulate the energy from the **equator to the poles**.

-They serve to warm the poles and at the same time **cool the waters of the equator**.

-In other words the ocean current spread out the heat energy all over the earth so that one area doesn't become **too hot or too cold**.

### **What causes ocean currents?**

-The main cause of ocean currents is **heating of the ocean by the sun**.

-At the equator the sun **strongly heats** the water.

-As the water warms is gets lighter (less dense) and **begins to rise**.

-Cooler, denser water sinks and rushes in to **replace the warmer water**.

-This movement of water creates enormous **convection currents**.

-We see warm surface currents flowing toward the poles while at the same time we get cold deep-water currents flowing toward the equator.

-The surface currents are pushed along and steered around the earth by the **prevailing winds.**

**Disruptions to the current system:**

-The phrase **El Niño** has been around for a long time.

-El Niño was originally just considered a **gentle warming of the Pacific Ocean** near the west coast of South America.

-It usually occurred **around Christmas time each year** in which local people related the El Niño with poor fishing.

-Normally the wind blow off the land in South America **pushing away the warm surface water.**

-The cold **nutrient rich water rises up** (upwelling) and fish thrive.

-During the El Niño wind patterns change and **warm surface water is no longer pushed away.**

-Since the water is not circulating **it cannot cool**.

-The cold water with all its nutrients **is trapped and cannot rise up**.

-No nutrients getting to the surface **means poor fishing**!

-Over the past few years El Niño has become somewhat of a weather celebrity.

-The weather media has blamed it for **climate variation all over North America**.

-With more study of ocean currents it has been discovered that El Niño is **much larger than first thought.**

-During an El Niño year the Pacific Ocean undergoes a **greater than normal amount of heating.**

-The extra heating disrupts and changes the normal patterns of convection currents and wind patterns in the Pacific Ocean.

-A long lasting El Niño effect is believed to **affect the weather of the entire planet.**

**-The direct cause of El Niño is unknown but it is believed to be connected to global warming**.

##### **What does this mean to us:**

* During El Niño years the **jet stream tends to push further north**.
* Air north of the jet stream **is cooler than air south** of the jet stream.
* As result North America tends to receive **warmer than normal average temperatures.**
* During an El Niño year in Newfoundland we would get a warmer winter than normal which would mean **more rain and less snow**!

##### **A reversal - La Niña:**

* About every four to five years, a pool of **cooler-than-normal water** develops off South America.
* The effects of this cooler water are called **La Niña**.
* This usually shifts the jet stream farther south which **steer’s colder drier winters to the Canadian west.**
* For Newfoundland it may **bring cooler wetter conditions** - lots of snow!

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