

Ocean Currents & Climate

- **The student will be expected to demonstrate an understanding of how ocean currents affect climate.**

Ocean Currents & Climate

Outcomes...

- In this lesson you will learn to...
- 2.4.1 Define the term ocean current. (k)
- 2.4.2 Analyze how ocean currents can create different climatic conditions for two coastal locations on the same latitude. (a)

Ocean Currents

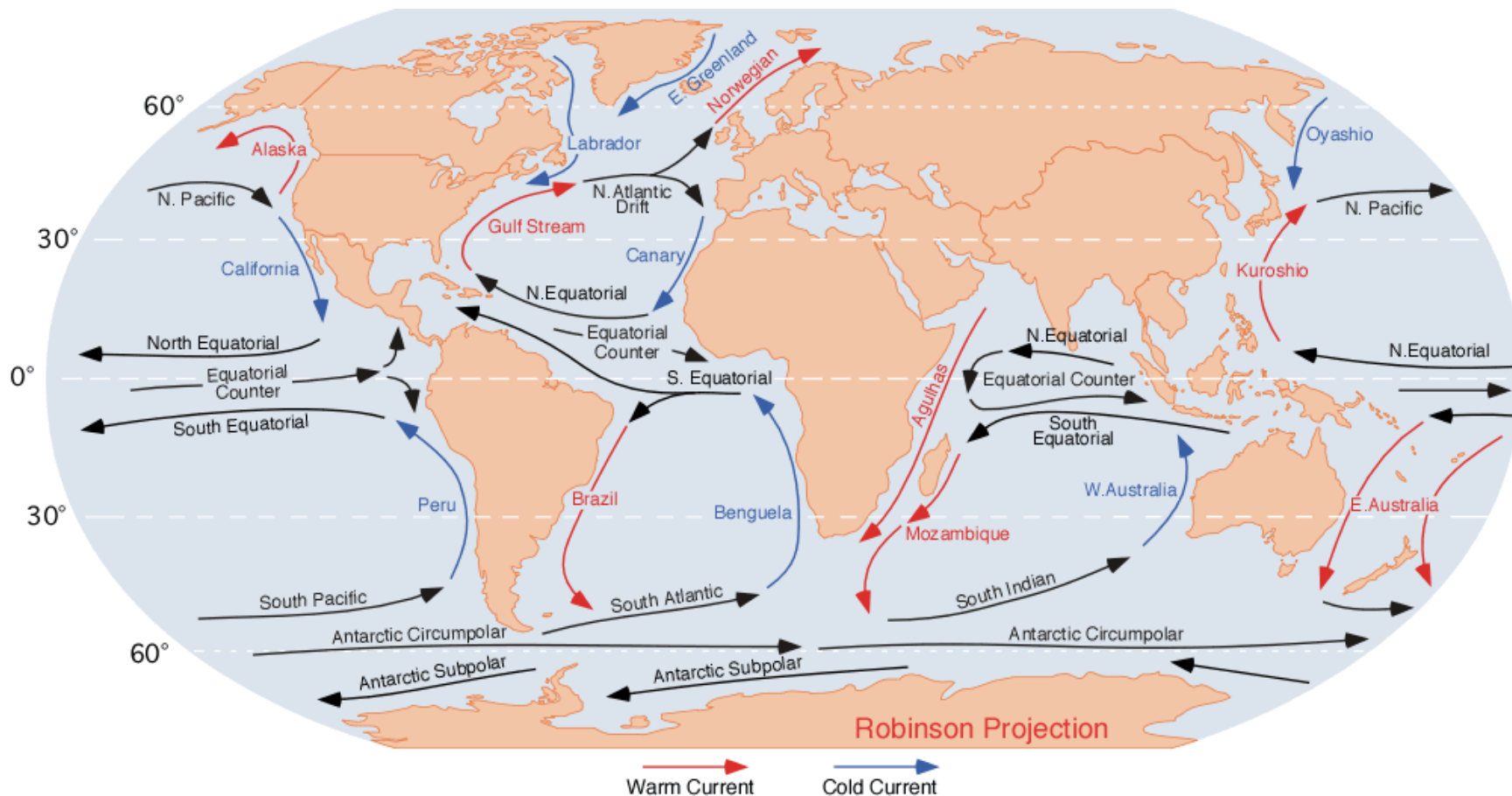
- **DEFINITION:** Ocean currents are the permanent or semi-permanent **horizontal movement** of surface water (the top 100m).
- **Videos:**
 - [Ocean currents explained](#)
 - [Bill Nye- Ocean Currents](#)
- It is unusually cold or hot when compared with the surrounding water.
- Caused by and shaped by:
 - prevailing winds,
 - variations in air temperature
 - density of water
 - Coriolis force

Cold ocean currents

- **Cold water currents** move water **towards the equator**.
- For example the **Peru Current** carries cold water from Antarctica toward the equator.
- Another example is the **Labrador Current** which carries cold water from the Arctic Ocean.
- See pg 60 for a diagram of ocean currents

Warm ocean currents

- **Warm water currents** move water **away from warm equatorial regions**.
- Example: The **Gulf Stream** moves warm water from the Gulf of Mexico, past Newfoundland and then northeast toward England.
- Another good example is the **Japanese Current** which moves warm water from Japan northeast towards Vancouver.



Ocean Currents & The Affect on Climate

- **Effects of cold ocean currents**

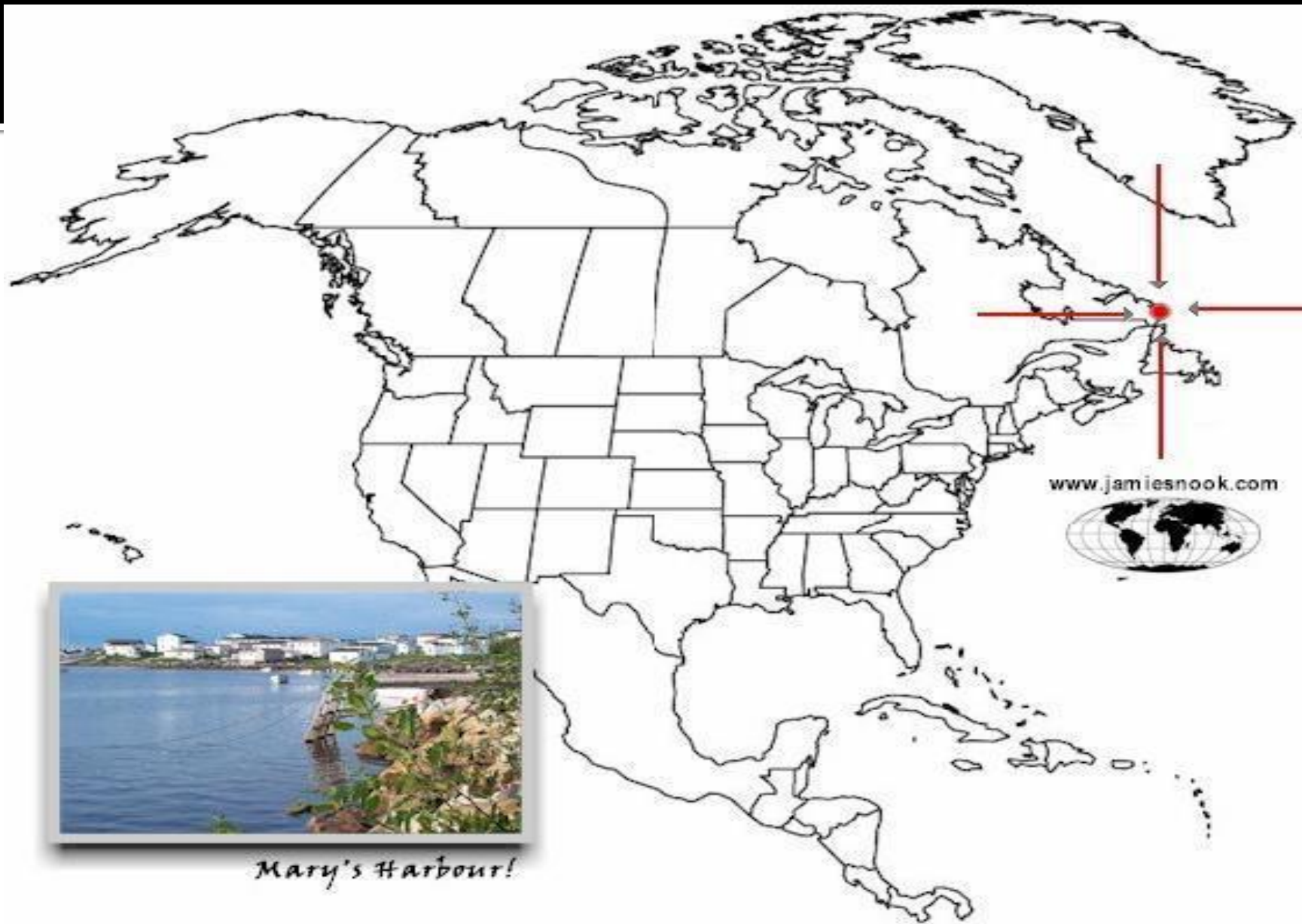
1. Cools the summer temperature
2. Reduces precipitation...cooler air holds less moisture.

Ocean Currents & The Affect on Climate

- **Effects of warm ocean currents**
 1. Warms the winter temperature
 2. Increases precipitation because warmer air holds more moisture

Example #1

- Mary's Harbour on the south coast of Labrador:
 - affected by the Labrador Current
 - cool summer temperatures
 - little precipitation for a location right on the ocean's edge.



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Mary's Harbour!



Example #2

- Vitoria, Brazil
 - affected by the Brazilian Current.
 - This gives high precipitation. The precipitation is further increased by the fact that the southeast trade winds blow off the warm ocean current onto the land.



Example #3...one to think about

- Newfoundland's south coast has ice-free ports year-long while its north coast has heavy ice for several months. The difference in latitude is not enough to explain this difference in ice.
- Can you explain it with ocean currents?

Ocean Currents ...Conclusion

- When considering the effect of ocean currents you must also consider the combined affect of the prevailing winds.
- The prevailing wind can make the coastal region feel the full effect of the current or if the prevailing wind is off shore it can reduce the affect of the ocean current.