4°C of Change

The World Bank's "Turn down the heat" program

By Michelle Crane

Teacher Consultant for the Texas Alliance for Geographic Education

Texas Alliance for Geographic Education

Current Climate Changes

- Global Mean Warming is .8^{o}C above pre-industrial levels
- Ocean temperatures are .09^{o}C warmer than in the 1950's
- Sea levels are 20cm higher than pre-industrial levels
- Sea levels are rising 3.2cm per decade

2°

- For years, scientists have been warning us of the effects of a 2° increase.
- Attempts have been made to ensure that we did not reach a 2° increase in temperatures.
- Current research suggests that 2° is no longer avoidable.
- Even if the current United Nations Framework Convention on Climate Changes pledges and commitments are met – a 4° increase seems likely.

Effects of a 4º increase – Global Temperatures

- Warming would not be evenly distributed.
  - most would be over land
  - it would range from 4º to 10º
  - increases of 6ºC could be expected across Mediterranean, North Africa, the Middle East and the US
- Increase in extreme temperatures ac
  - tropical areas would experience extreme temperatures
  - cool months would be warmer than the warmest months previously experienced
  - Increasing temperatures would increase heat-related deaths,
  - forest fires and loss of crops.

Increase in CO2 would also acidify the Ocean

- 150% increase in ocean acidity with 4^{o} increase
- Could cause wide spread extinction of coral reefs

Rising Sea Levels

- A 2º change would result in sea level changes of about 2 meters.
- A 4º change could cause up to a 4 meter change by 2300

  A .5 to 1 meter change would be expected by 2100

  - Sea levels will be higher in tropics, lower in polar
  - regions.

Distribution of Water will be affected

- Europe, Africa, North and South America and southern Australia will be drier.
- Northern North America, northern Europe, Siberia and monsoon regions will be wetter.
- Rivers in monsoon areas will be particularly affected – will affect availability of water
- Danube, Mississippi, Amazon, and Murray Darling river basin runoff will decrease by 20 to 40%
- Nile and Ganges will increase by 20%

Food security, Health and population growth

- Water availability, flooding, and drought will affect food production
- Population growth will increase food demand
- Flooding, drought, food scarcity, and increasing temperatures will increase spread of diseases
    - Diseases which are affected by precipitation and humidity will be particularly affected, such as vector borne diseases – malaria, dengue fever, Lyme disease

This project is funded in part by a grant from the National Geographic Society Education Foundation.

Notes & Credits

- Slide 1
  - All information from “Turn Down the Heat” a publication of The World Bank, 2012 http://climatechange.worldbank.org/sites/default/files/Turn_Down_the_heat_Why_a_4_degree_centrigrade_warmer_world_must_be_avoided.pdf