Teaching Climate Change
ASLE, June 2015
SueEllen Campbell
Changing Climates @ Colorado State University
(English & CMMAP)

Sonia R. Bhavani, 7, Kenya
Global Temperature and Carbon Dioxide

Temperature Change by Decade

National Climate Assessment 2014
Observed U.S. Temperature Change
There’s a BIG difference between doing a lot and doing nothing.
doing a lot . . . . . . doing nothing

Lower Emissions (B1)

Higher Emissions (A2)

Temperature Change (°F)

NCA
Observed Change 1901-2012

(changes to now)
(if we do a lot)
(if we do nothing)

Projected Temperature Change

Difference from 1986-2005 mean (°C)

Solid Color: Very strong agreement
Gray: Divergent changes
White Dots: Strong agreement
Diagonal Lines: Little or no change

RCP2.6 2081-2100
RCP8.5 2081-2100

IPCC via Scott Denning
Projected % increase in area burned every year for a 1°C rise in global temperature, compared to 1950-2003.

National Research Council, 2011
Historical Thermometer Records

Global Temperatures

- **Annual Average**
- **Five Year Average**

Temperature Anomaly (°C)

1880 1900 1920 1940 1960 1980 2000

http://commons.wikimedia.org/wiki/File:Instrumental_Temperature_Record.png
The Past 2000 Years

Reconstructed Temperature

Medieval Warm Period

Little Ice Age

2004 *

Temperature Anomaly (°C)

http://commons.wikimedia.org/wiki/File:2000_Year_Temperature_Comparison.png
Since the Last Ice Age

Since the Last Ice Age

Holocene “Optimum”

Little Ice Age

Deglaciation

IPCC

Modern Record

Shakun et al, Marcott et al, A1B, HadCRUT4

Temperature Anomaly [°C]

Year (BC / AD)
Reconstructions from Ice Cores

Ice Age Temperature Changes

Delta Temperature (°C)

Low

High

Thousands of Years Ago

EPICA

Vostok

Ice Volume

http://commons.wikimedia.org/wiki/File:Ice_Age_Temperature.png
Natural Cycles

[Graph showing variations in Carbon Dioxide and Antarctic Temperature over time.]

NASA