WELCOME TO CLIMATE 101





INTRODUCTION TO CLIMATE

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CLIMATE ADAPTATION SCIENCE TEDC









Climate Adaptation Science Center Regions

SOUTH CENTRAL CASC

Established in 2012, the South Central **Climate Adaptation Science Center** provides natural and cultural resource managers with the science, tools, and information they need to address the impacts of climate variability and change on their areas of responsibility.







CLIMATE CHANGE IMPACTS TO...

Agriculture



Water



Commerce

Health



Energy







Ecosystems



Communities





Coastal

Forests

Infrastructure



Carlye Calvin & Wikipedia photos

SUPPORT FOR THE NEXT GENERATION











TRIBAL ENGAGEMENT STRATEGY

Introductory meetings & outreach with Tribal staff



Tribal youth programs





Co-production of knowledge with Tribes

> Independent Tribal climate projects & integration into Tribal plans

KEY POINTS

The South Central Climate Adaptation Science Center is a partner of Tribes, Pueblos, and U.S. Department of the Interior agencies. We conduct research and provide translation of science to action in a changing climate.

We co-produce knowledge with our partners so that everyone can benefit. We seek to understand your unanswered questions about climate variability and change.



WEATHER VS. CLIMATE

or dryness, calm or storm, clearness or cloudiness; short-term

Climate – statistical collection of weather conditions at a place over a period of years; long-term

"Climate is what you expect. Weather is what you get."





- Weather state of the atmosphere with respect to heat or cold, wetness

WEATHER VS. CLIMATE

- Weather
 - What type of clothing should I wear today?
 - Should we open or close our windows today?
 - Is it dry enough to harvest my crop tomorrow?
- Climate
 - What clothing should I buy for my wardrobe?
 - What materials should I build my house from?
 - How much and what type of crops should I plant?





EARTH'S CLIMATE SYSTEM





EARTH'S CLIMATE SYSTEM

- Incoming & outgoing radiation energy input & output
- Albedo percent of incoming sunlight reflected
- Atmospheric composition absorption of energy at different wavelengths
- Temperature driven by latitude, elevation, clouds, land-water differences
- Pressure global highs & lows, prevailing winds
- Ocean currents movement of cold vs. warm waters
- Air masses movement of air with differing characteristics
- Topography creates irregularities in other patterns
- Precipitation driven by all of the above



AVERAGE NET RADIATION AT SURFACE



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GLOBAL ALBEDO





ATMOSPHERIC COMPOSITION

Gas	Symbol	
Nitrogen	N_2	
Oxygen	O 2	
Water Vapor	H ₂ O	
Argon	Ar	
Carbon Dioxide	CO 2	
Neon	Ne	
Helium	He	
Methane	CH4	
Hydrogen	H_2	
Nitrous Oxide	N2O	
Ozone	O 3	



NOAA National Weather Service Jetstream

Content

78.084%

20.947%

0-4%

0.934%

0.0360%

0.0018%

0.0005%

0.00017%

0.00005%

0.00003%

0.000004%

0.040% Carbon dioxide (CO₂) 0.934% Argon (Ar) -Trace gases 20.946% Oxygen (O₂) 78.084% Nitrogen (N₂)

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GLOBAL AIR TEMPERATURES (JULY)





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Figure 5.16

GLOBAL PRESSURE PATTERNS



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MAJOR OCEAN CURRENTS





AIR MASSES (TEMPERATURE & MOISTURE)





TOPOGRAPHY





WORLDWIDE AVERAGE PRECIPITATION ARCTIC OCEAN





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Figure 6.1

KEY POINTS

in one part of the world eventually affects other areas.

elsewhere may ultimately have a great impact here.

and interpret climate information



- The global climate system is complex and interconnected. What happens
- Although we must focus on our region for decision making, it's a good practice to remember the bigger picture from time to time, as changes
- The South Central CASC and your state climate office can help you access





QUESTIONS?