

Roots, Shoots and New Growth: Perspectives on CCR's 50th

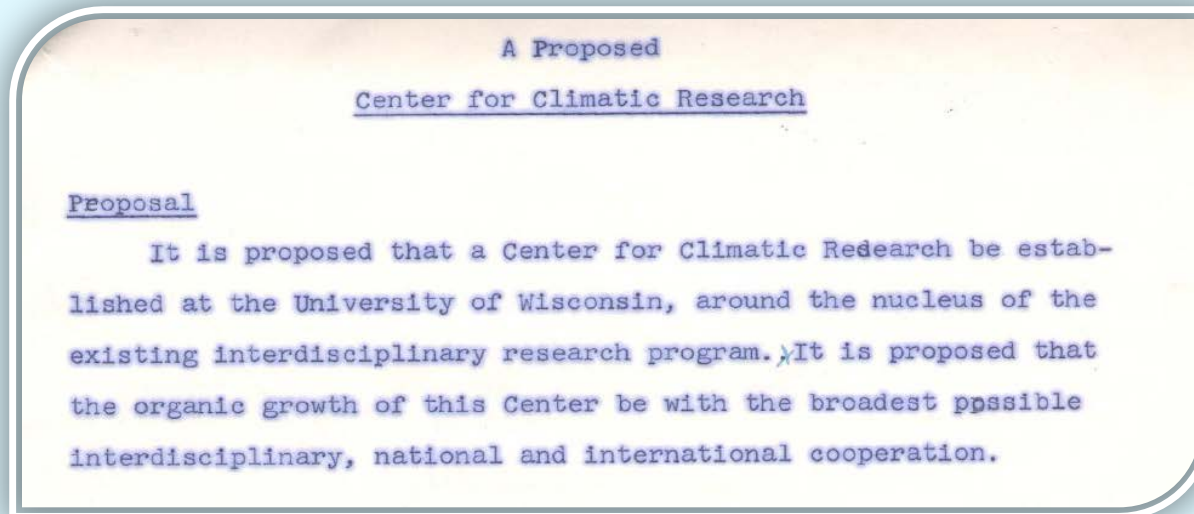
**John Kutzbach
Atmosphere/Ocean Science, Nelson Institute
University of Wisconsin-Madison**

October 2013

The Proposal

Reid Bryson proposes to the National Science Foundation to establish a “**Center for Climatic Research**” with an “**interdisciplinary research program**”

*Submitted Feb 1962
Funded 1963*



*Handwritten
Typed
Mimeographed*

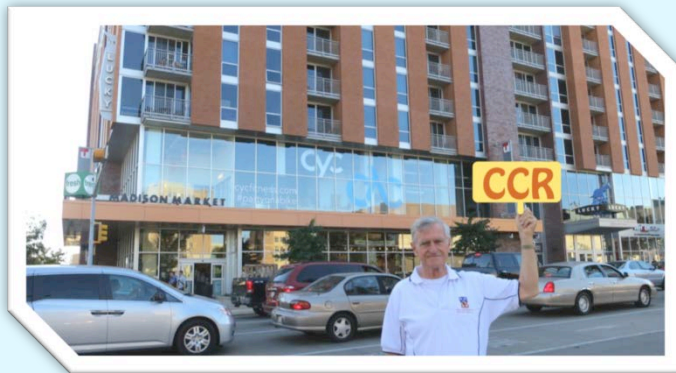
Disciplines: meteorology, geology, ecology, palynology, geochemistry, geography, archaeology
Research Areas: field climatology, paleoclimate, climate and cultures, bioclimatology

- Initial group: Bryson, Lettau, Ragotzkie, Baerreis, Tanner (partial list)

The Space



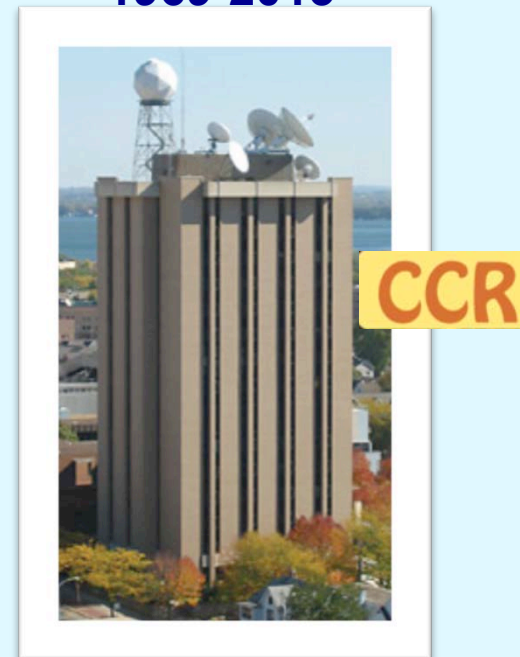
733 University Avenue
1963-1969
rented building - formerly
Sergenians Carpets



733 University Avenue
Today

University Square

1969-2013



The Time

1957 – Sputnik --- Start of USA strong investment in science and engineering

1958 – NASA formed
first scientific observations of planet earth - Explorer VII and Vern Suomi)

1962 – John Glenn orbited earth in Friendship 7

1963 – CCR founded

1963 – Department of Meteorology publishes:
“Meteorology at Wisconsin – A plan for the future”



METEOROLOGY AT WISCONSIN A PLAN FOR THE FUTURE

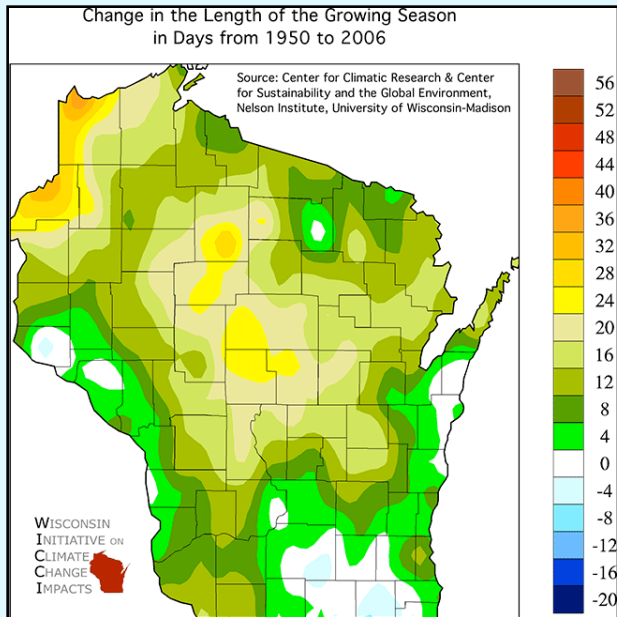
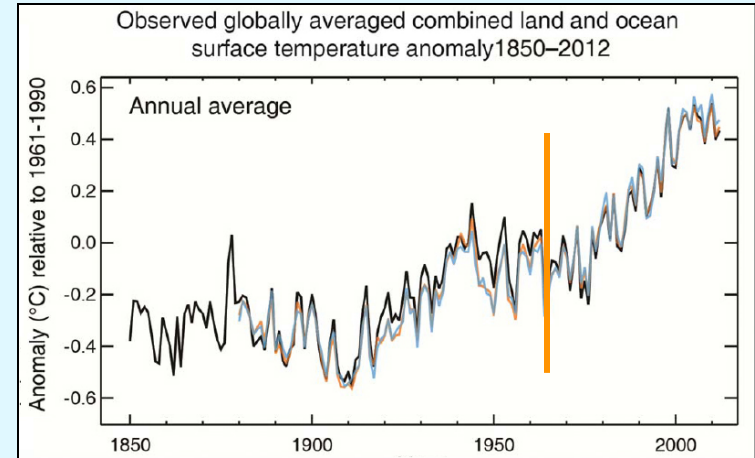
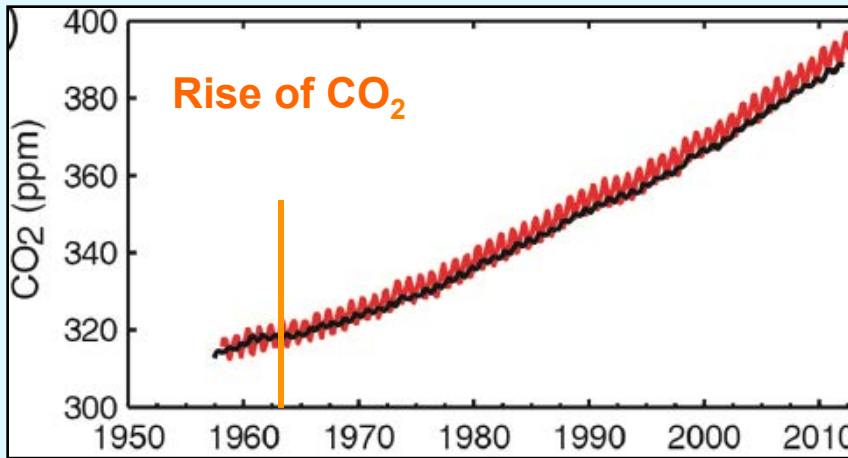
Preamble. The Department of Meteorology at The University of Wisconsin was born in 1948. In this document we shall try to project the possibilities and potentialities ahead to 1970. This means a forecast of more than half the lifetime of the department—an ambitious project even for meteorologists. However, in the present-day rapid development of the atmospheric sciences the department must look ahead. Meteorology is on the move, we must decide how to move with it.

This document is the result of teamwork. Beginning in May 1962 the academic staff of the department has spent many hours of deliberation in a number of special conferences devoted to the discussion of the future development of meteorology at The University of Wisconsin.

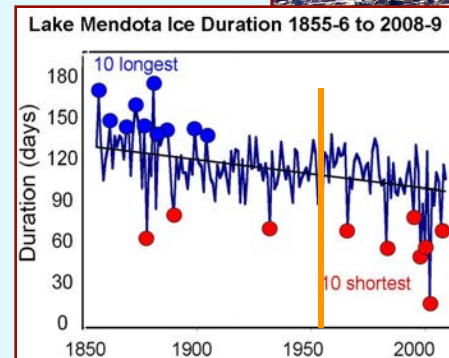
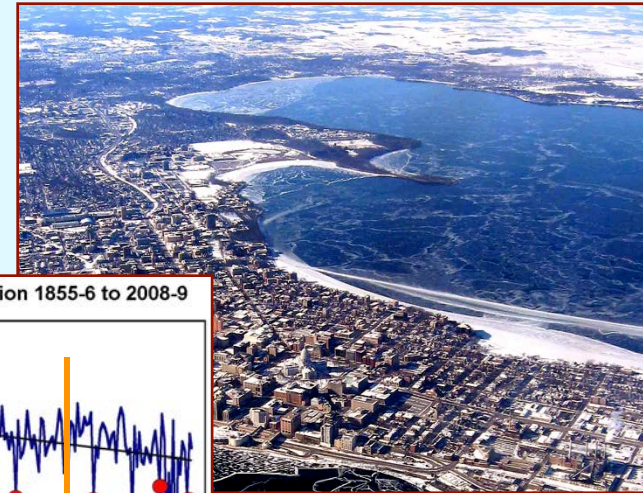
This team effort has resulted in the formulation of “Meteorology at Wisconsin, a Plan for the Future.”

Madison, June 1963	R. A. Bryson
	R. J. Deland
	L. H. Horn
	H. H. Lettau
	R. A. Ragotzkie
	S. A. Rossby
	W. Schwerdtfeger
	V. E. Suomi
	E. Wahl

The Climate: CO₂, Global Temperature, Wisconsin



Growing Season has increased by 1-4 weeks since 1950



J. Magnuson

ROOTS: Early Studies 1965-1975

- Field climatology studies
- Climata and Biota
- Climate Change and Variability
- Climate and Cultures

Facilities:

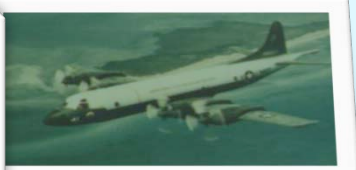
Radiocarbon lab

Palynology lab

Tree-ring lab

Field climatology instrumentation lab

Field Climatology



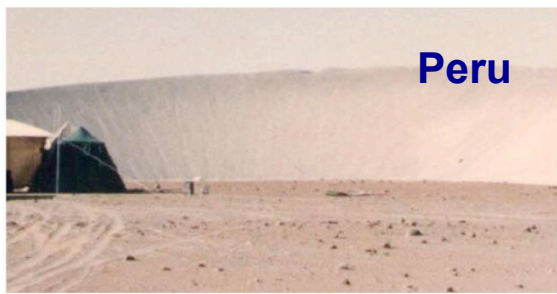
N.America



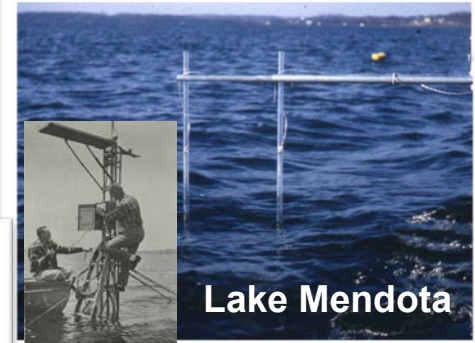
Canada



India

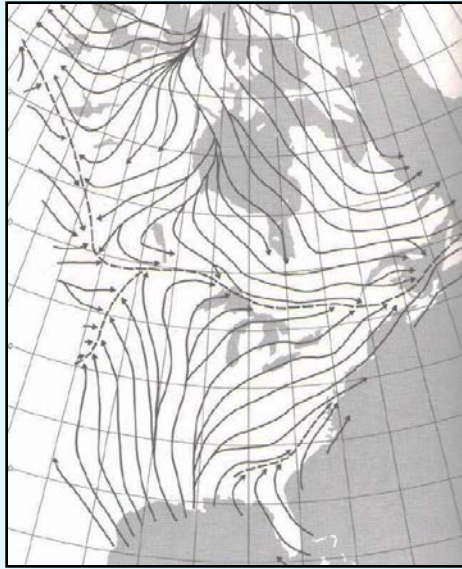


Peru



Lake Mendota

Climata and Biota

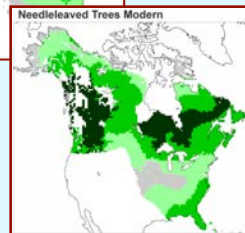
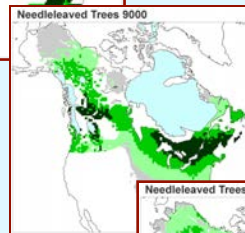
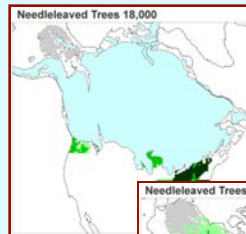


Airstreams



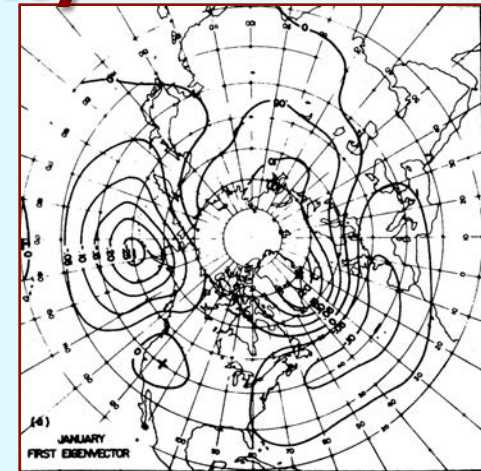
Climate boundaries and biota

Climate Change

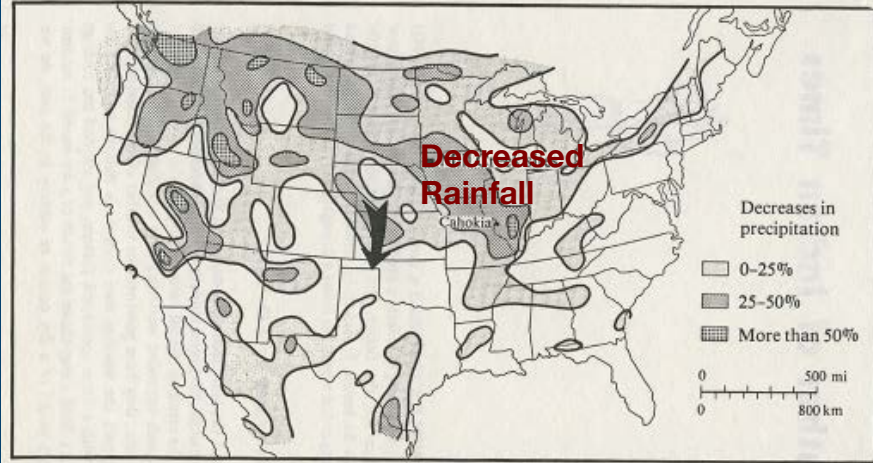


Deglaciation and vegetation change

Climate Variability



Climate and Cultures



Mill Creek farmers and climate change – around 800 years ago

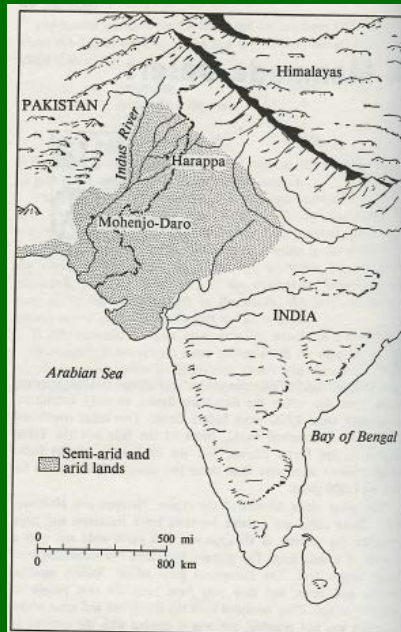
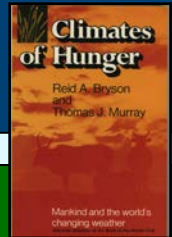


Figure 8.1. India and the Indus River valley.

Indus Valley Culture and Climate Change – around 4000 years ago

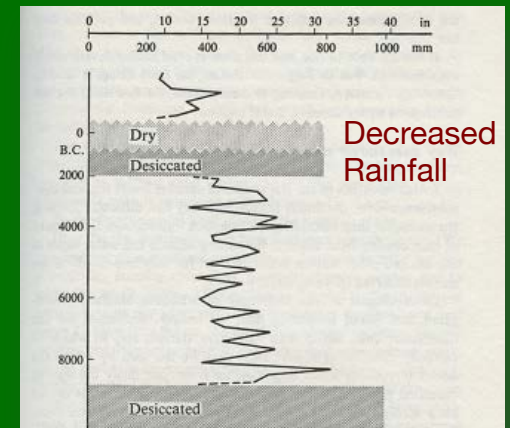


Figure 8.2. Amount of summer monsoon rainfall, calculated from pollen data, Lunkaransar, Rajasthan, India. Adapted from Bryson, 1975a; based on Singh, 1971.

CCR and IES



1970 - CCR staff

1970 - Formation of IES (now Nelson Institute):

Bryson first director,
and three research centers:

CCR – John Kutzbach

MSC – Bob Ragotzkie

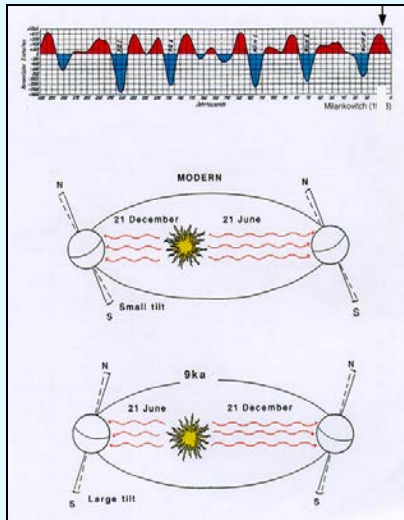
ERSC – Tom Lillesand



1979 – CCR staff on Lake Mendota

SHOOTS: 1975-1995

Sahara desert

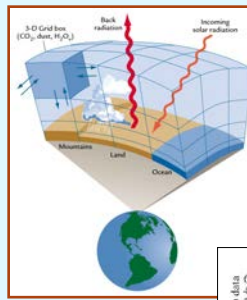


Changes in Earth's Orbital parameters

Model

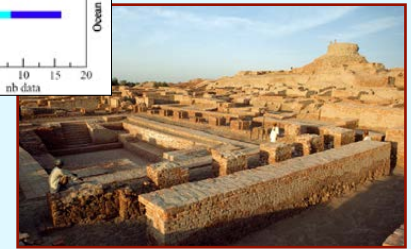
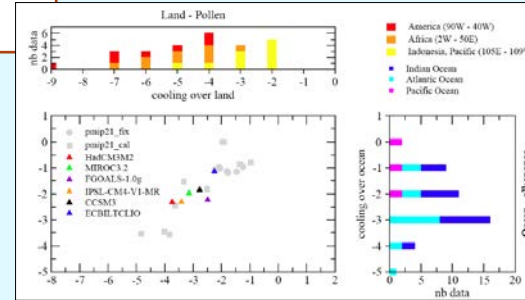


Kutzbach, 1981

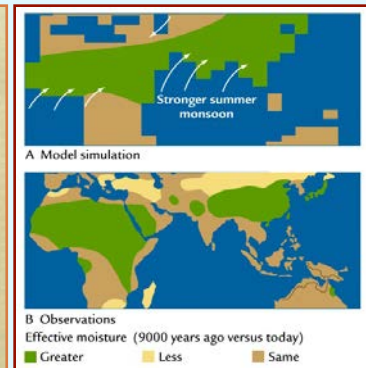
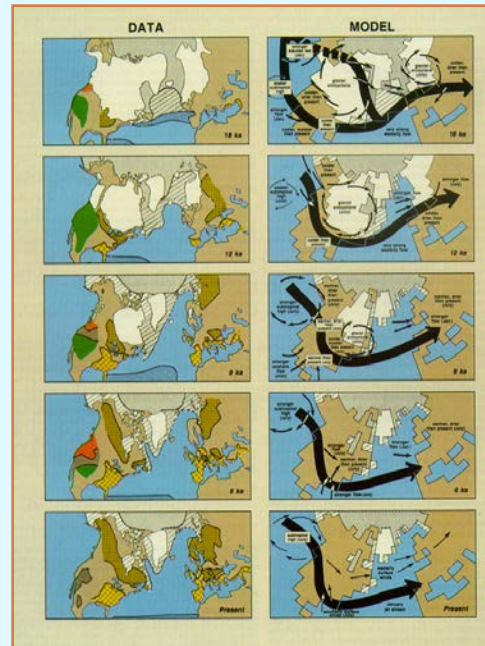


Development of Climate Models

- test hypotheses for climate change
- compare model with observations
- validate and apply



COHMAP



COHMAP Meeting: UW-Madison - 1986



Disciplines represented:

climate
oceanography
geology
glaciology

botany
ecology
ecology
archeology

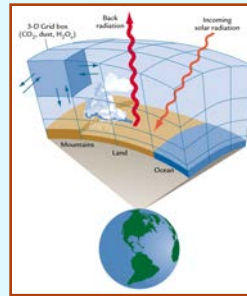
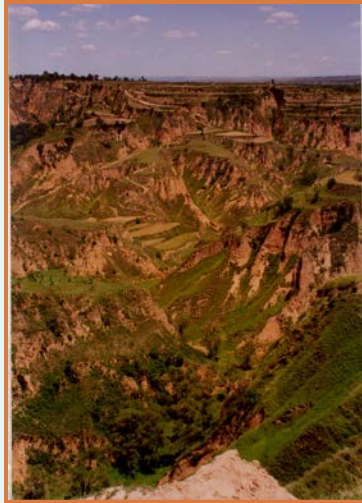
atmospheric chemistry
vegetation dynamics
paleoecology
computer modeling
statistics



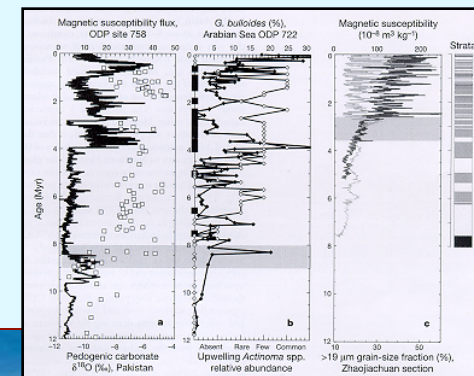
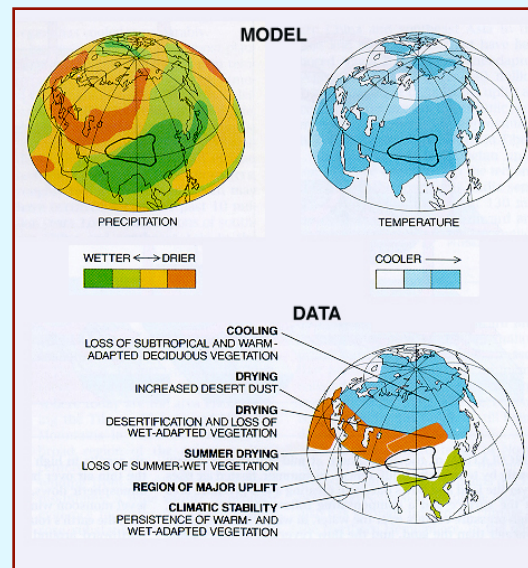
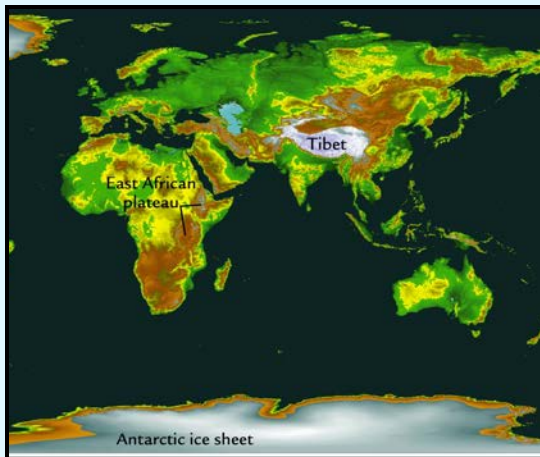
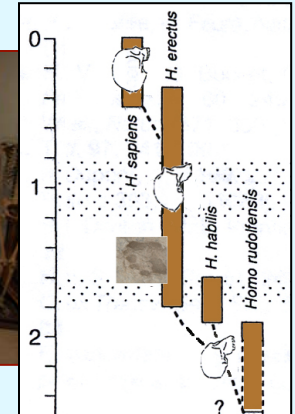
COHMAP T-shirts

Shoots: 1975-1995

Uplift of
mountains and
plateaus



- ## Development of Climate Models
- test hypotheses for climate change
 - compare model with observations
 - validate and apply



New Growth

- **Climate, People, Environment Program (CPEP)** Foley, Hotchkiss, Williams, Vimont
- **Atmosphere-ocean** Liu, Vimont, McKinley, Chen, Lorenz, He, Vavrus
- **Atmosphere-ocean-biosphere** Liu, Williams, Notaro
- **Biogeochemistry, ecosystem exchanges** McKinley, Desai
- **Climate change simulations and analyses** Liu, He, Vavrus, Chen, Notaro, He, Williams
- **Polar climates** Vavrus, He, Liu
- **Biodiversity and climate change** Williams, Hotchkiss
- **Climate and culture** Vavrus, Hotchkiss, Vimont, He
- **Future climate: IPCC, WICCI** all of CCR

CCR Directors

Reid Bryson 1963-1970
John Kutzbach 1970-2002
Zhengyu Liu 2002-2011
Jack Williams 2011-now



THANK YOU

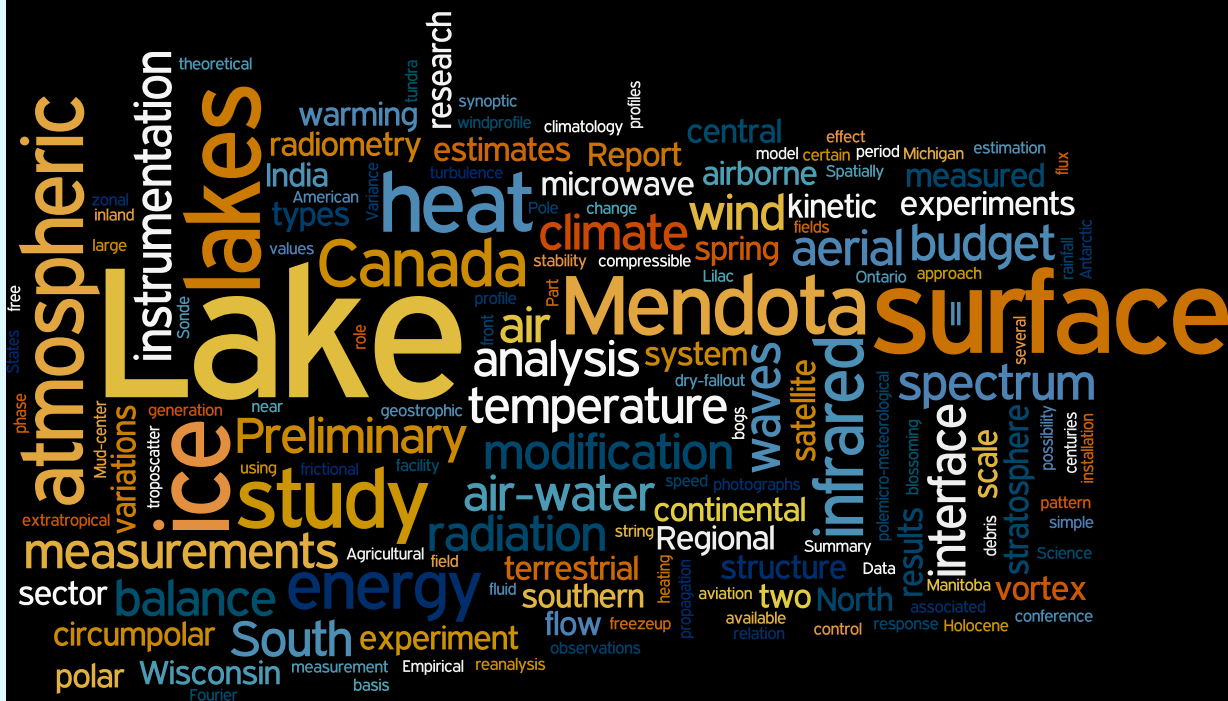
Meteorology
AOS
IES
NI
L&S

NSF
DOE
NASA
NOAA

UW-Madison
State of Wisconsin
DNR
Private donations

CCR Research Then & Now

**Word Cloud from CCR
publication titles
early years**



Word Cloud from CCR publication titles in recent years

**Over 1000
Publications
In 50 years**