

3/4/05

Applied Research Center for Paleoclimatology

The Applied Research Center for Paleoclimatology is an activity of the Paleoclimatology Branch of the National Climatic Data Center. The Branch archives and distributes published paleoclimate data needed to understand decadal to millennial scale climate variability. The data are used by national science initiatives such as the Climate Change Science Plan, and international science initiatives such as the IPCC Assessment. The ARC activities consist of two elements, 1) the creation and refinement of paleo Climate Data Records based on published research data, and 2) the application of ARC principles to the entire set of paleoclimate data (e.g., updating records, evaluating uncertainty where appropriate). <http://www.ncdc.noaa.gov/paleo/>

1) Basic Description of Data Set

A) Variables: Temperature, precipitation, ocean salinity and nutrient concentration, plus a wide range of environmental variables from paleo sources, including the concentration of trace gases in the atmosphere, the stable isotope ratios of oxygen and hydrogen and carbon, the accumulation of materials such as wind blown dust, as well as specific elements and isotopes, and the distribution of fauna and flora on the land surface and surface and deep ocean.

B). Types of observations: Quantitative measurements of environmental variables derived from ice cores, tree rings, ocean and land sediments, cave deposits, borehole measurements, corals and other marine carbonates, and other records.

C) Geographical Coverage: Global

D) Resolution: Seasonal to multi-century.

E) Duration: The oldest records span the past 60 million years, however the data density decreases going backwards in time. Most of the data span the past several thousand years.

F) Update interval: Irregular

G) Access mechanisms WWW, FTP

H. Operational Applications: CCSP chapter 4 research products (Arctic temperature change), CCSP synthesis products (Abrupt climate change), IPCC Assessment (paleo chapter), local and regional hydrology planning and decision making.

2) Scientific Stewardship Activities

The two highest priority stewardship activities are 1) soliciting new data and 2) adding information and details to data received so that it can be found and used by other scientists. In general, activities that produce new numbers (uncertainty or error statistics, new time series) are accomplished by outside experts and sent to the data center after

they have been published in a peer-reviewed journal. (For the paleo ARC, peer review is considered the first and most important step in quality control). In FY05, the ARC is working on several aspects to refine, and make available information on the age uncertainty, and amplitude uncertainty of paleo data. We worked with PI Ed Cook to provide new graphical displays of uncertainty related to the PDSI data set. In spring '05, all tree ring data will be analyzed by the COFECHA program to evaluate age errors, and this information will be made available with the data sets.

3) Funding Request

The program currently receives approximately \$360k per year for activities that support the ARC. There is an unmet need for additional funds to support the formation of extramural data cooperatives, so that outside experts can expand and improve specific data sets (\$100-500k).