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VEMAP 2: U.S. MONTHLY CLIMATE CHANGE SCENARIOS, VERSION 2

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Summary:

The Vegetation/Ecosystem Modeling and Analysis Project (VEMAP) Phase 2 has developed a number of transient climate change scenarios based on coupled atmosphere-ocean general circulation model (AOGCM) transient climate experiments. The purpose of these scenarios is to reflect time-dependent changes in surface climate from AOGCMs in terms of both (1) long-term trends and (2) changes in multiyear (3-5 yr) to decadal variability patterns, such as El Niño/Southern Oscillation (ENSO). Development of the data set is reported in Kittel et al. (1997).

Scenarios have been derived from transient greenhouse gas experiments with sulfate aerosols from the [Canadian Climate Center \(CCC\)](#) and the Hadley Centre (HADCM2; Mitchell et al. 1995, Johns et al. 1997) accessed via the [Climate Impacts LINK Project](#), Climatic Research Unit, University of East Anglia. Scenarios were developed for the following variables: total incident solar radiation, minimum and maximum temperature, vapor pressure, precipitation, relative humidity and mean monthly irradiance for the time periods January 1994 to approximately 2100. These data and the [VEMAP 1 data](#) (Kittel et al. 1995) were used to drive models in VEMAP Phase 2, the objectives of which are to compare time-dependent ecological responses of biogeochemical and coupled biogeochemical-biogeographical models to historical and projected transient forcings across the conterminous United States.

This data set of monthly climate change scenarios was designed to be concatenated with the [VEMAP 2: U.S. Monthly Climate, 1895-1993, Version 2](#) data set to create a single climate series from 1895 to ~2100.

This data set is being made available for the [U.S. National Assessment](#).

Users are requested to confer with the [NCAR VEMAP Data Group](#) to ensure that the intended application of the data set is consistent with the generation and limitations of the data.

For more information, refer to the [VEMAP homepage](#).

Data Citation

Cite this data set as follows (data citation revised on September 20, 2002):

Kittel, T.G.F., N.A. Rosenbloom, C. Kaufman, J.A. Royle, C. Daly, H.H. Fisher, W.P. Gibson, S. Aulenbach, D.N. Yates, R. McKeown, D.S. Schimel, and VEMAP 2 Participants. 2001. VEMAP 2: U.S. Monthly Climate Change Scenarios, Version 2. ORNL DAAC, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/567>.

References:

Johns T. C., R. E. Carnell, J. F. Crossley, J. M. Gregory, J. F. B. Mitchell, C. A. Senior, S. F. B. Tett, and R. A. Wood. 1997. The Second Hadley Centre coupled ocean-atmosphere GCM: Model description, spinup and validation. *Climate Dynamics* 13:103-134.

Kittel, T. G. F., N. A. Rosenbloom, T. H. Painter, D. S. Schimel, and VEMAP Modeling Participants. 1995. The VEMAP integrated database for modeling United States ecosystem/vegetation sensitivity to climate change. *Journal of Biogeography* 22:857-862.

Kittel, T. G. F., J. A. Royle, C. Daly, N. A. Rosenbloom, W. P. Gibson, H. H. Fisher, D. S. Schimel, L. M. Berliner, and VEMAP2 Participants. 1997. A gridded historical (1895-1993) bioclimate dataset for the conterminous United States. Pages 219-222, in: *Proceedings of the 10th Conference on Applied Climatology*, 20-24 December 1997, Reno, NV. American Meteorological Society, Boston.

Mitchell J. F. B., T. C. Johns, J. M. Gregory, and S. Tett. 1995. Climate response to increasing levels of greenhouse gases and sulphate aerosols. *Nature* Vol 376:501-504.

VEMAP Members. 1995. Vegetation/Ecosystem Modeling and Analysis Project (VEMAP): Comparing biogeography and biogeochemistry models in a continental-scale study of terrestrial ecosystem responses to climate change and CO₂ doubling. *Global Biogeochemical Cycles* 9:407-437.

Data Format:

This is a gridded data set of monthly climate change scenario modeling outputs for the conterminous U.S. Data files are in full-grid netCDF format; that is, the data are stored in time/lat/lon format representing a full snapshot of the gridded U.S. (including background values) for each time slice.

For information on companion files as well as Parameter/Variable Names, Variable Description/Definition, Units of Measurement, and Data File Formats see this companion file:

<http://daac.ornl.gov/vemap-2/TSCENARIO/monthly/comp/readme.tscenario>.

Guides to the netCDF file format (including links to display software and editing tools, e.g., NCOs) can be found at <http://www.unidata.ucar.edu/packages/netcdf>.

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