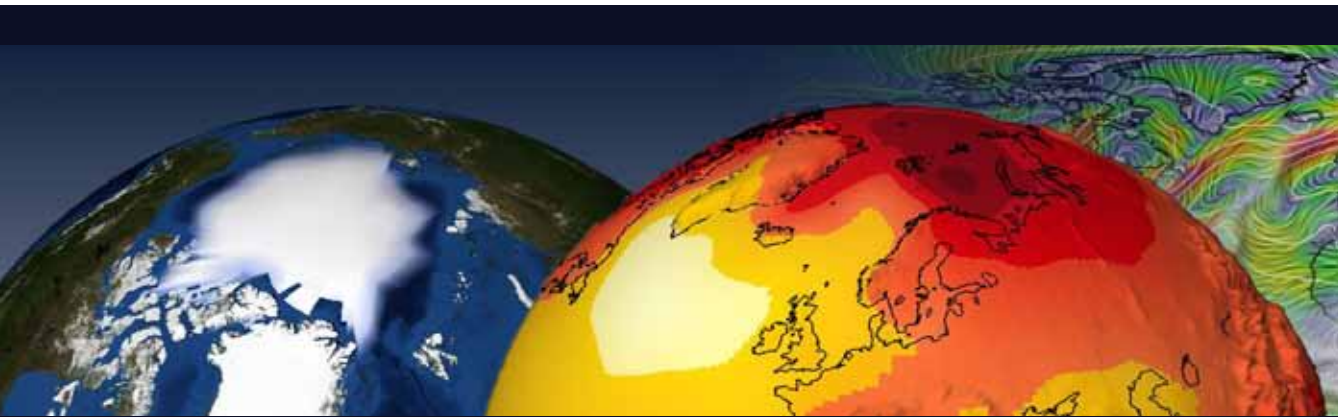


## Customer Spotlight

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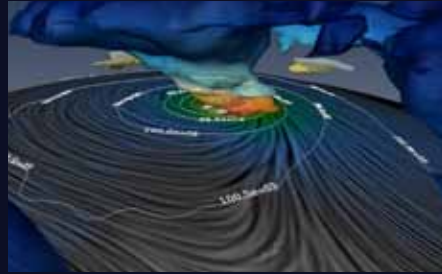
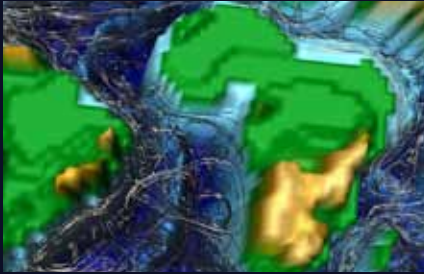
# DKRZ uses Avizo® to visualize and understand weather and climate



**The German Climate Computing Center** (Deutsches Klimarechenzentrum , DKRZ) is the German national high performance computing center for climate research. DKRZ provides the German community with the high performance computing power and storage facilities needed for extensive numerical simulations with coupled models of the climate system, as well as associated services such as help with model optimization and data visualization.

# Visualization of weather and climate

By Michael Böttinger, Deutsches Klimarechenzentrum (German Climate Computing Center)



Left: Illuminated Streamlines showing the simulated mean ocean circulation 55 million years ago.

Right: Tropical storm visualized with Avizo: cloud cover isosurface colorized by temperature, LIC of the surface wind field plus surface pressure isolines.

Due to the quickly growing size of the simulation data, analysis and visualization of the time-dependent multivariate 3D results is an increasingly difficult task. Visual data analysis is a powerful tool to handle the challenges of these large datasets, with focus particularly on the major patterns and processes simulated by the complex coupled models. For interactive 3D visualization of climate data, DKRZ offers its users access to an advanced visualization server system (based on HP's SVA architecture) and a remote 3D-rendering solution (HP RGS), which allows interactive use of the system from remote locations. The visualization software solution mainly used on the system is Avizo®, as it provides unique visualization capabilities.

With its powerful NetCDF-CF1 file interface, Avizo is able to read and visualize the typical long time series of multivariate 3D data produced by weather and climate models using the most common native file formats. Depending on the local hardware configuration, large files can be cached in memory in order to accelerate the interactive access. Very large time-dependent files can be visualized right away from the hard disks.

A topography and map module, complemented by a geographic projection module with user-definable exaggeration of the vertical axis allows users to interactively explore the data in the correct geographic context.

**Avizo®** offers a wide range of state-of-the-art visualization methods as well as advanced methods and features such as line integral convolution, illuminated streamlines and particle advection for visualizing vector fields like wind and ocean currents.

With the Xscreen eXtension, Avizo visualizations can easily be ported to VR equipment such as DKRZ's VR-Powerwall or autostereoscopic displays.

Images: DKRZ, Max-Planck-Institute for Meteorology

## About Avizo®

Avizo® software is a powerful, multifaceted tool for visualizing, manipulating, and understanding scientific and industrial data. Wherever three-dimensional datasets need to be processed, in material sciences, geosciences, environmental science or engineering applications, Avizo offers abundant state-of-the-art features within an intuitive workflow and easy-to-use graphical user interface.

## About DKRZ

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