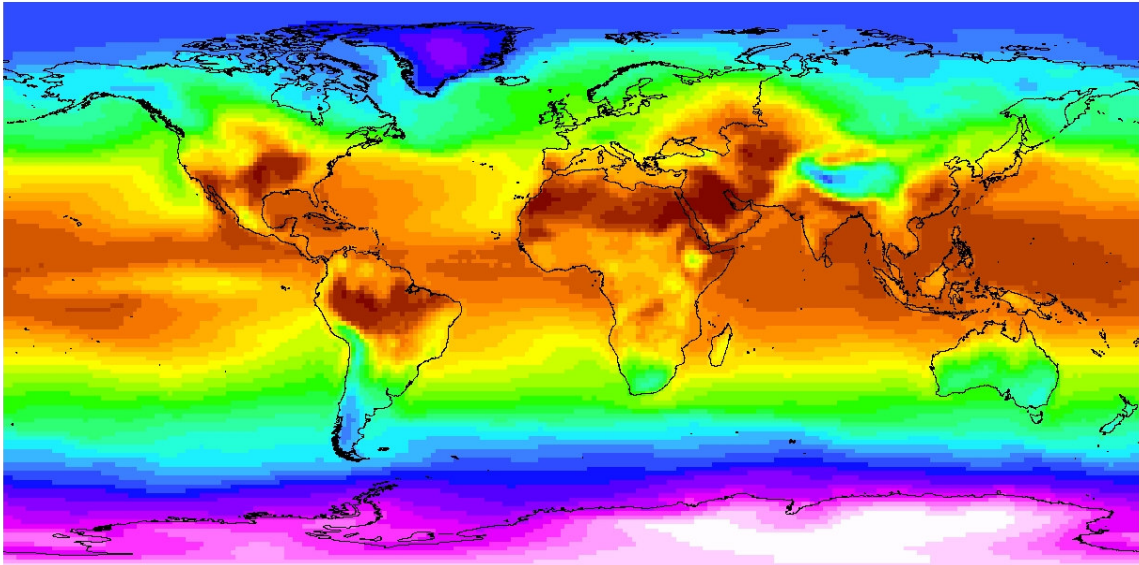


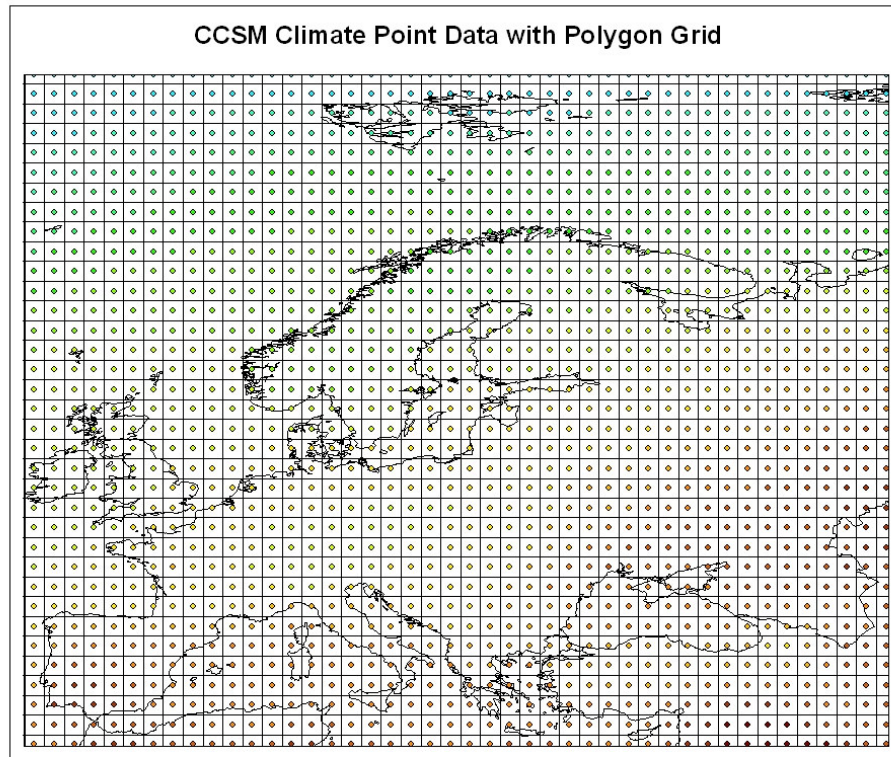
CCSM Global Polygons



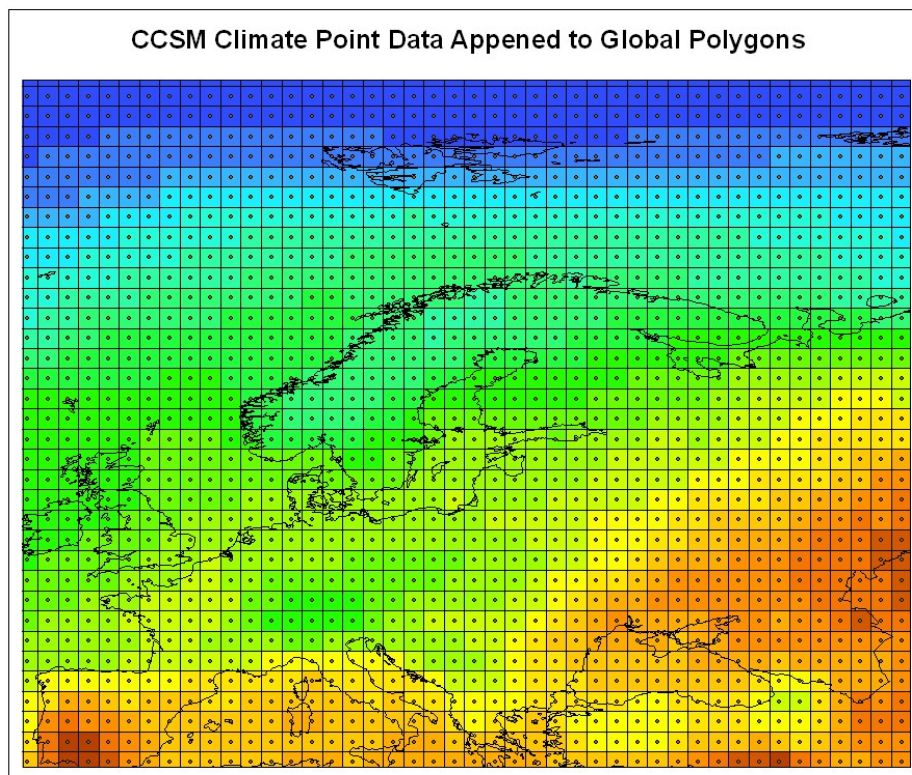
Climate change projections from the Community Climate System Model (CCSM-3) are generated on a Gaussian grid, which is commonly used in scientific modeling. With a Gaussian grid, each grid point can be uniquely accessed by one-dimensional latitude and longitude arrays (i.e. the coordinates are orthogonal). In the CCSM model output, distributed here, the longitudes are equally spaced at 1.40625° , while the latitudes vary in spacing from 1.389° to 1.400767° . Due to irregular nature of the gridded CCSM model output this portal distributes the datasets in a point shapefile format, where each point represents a centroid of a corresponding CCSM grid cell.

To more accurately represent a continuous surface of global climate, we are providing a global *polygon* dataset for use with the CCSM modeled climate projections. This polygon layer was derived using the 4 corner coordinates, based on latitude and longitude, for each grid cell of the CCSM outputs. This creates irregular, rectangular polygons, as in a Gaussian grid of the original model output.

The polygon file is in the same CCSM-defined projection as the CCSM climate change data - a Geographic Coordinate System on a perfect sphere with a radius of 6371.22 KM. With this polygon layer, the attributes of the climate change projections point features can be appended to the corresponding polygon features to get an accurate spatial distribution of the modeled climate data across the globe. Each point is the centroid of the corresponding polygon (shown in Figure below).

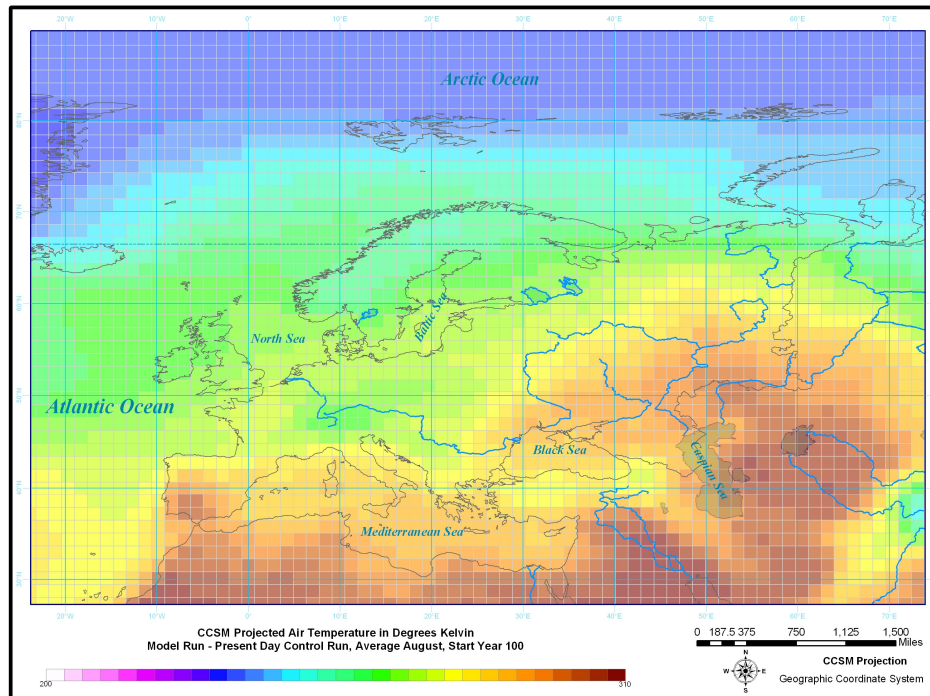


In ArcGIS, the Spatial Join tool creates a table join in which fields from one layer's attribute table are appended to another layer's attribute table based on the relative locations of the features of the two layers. The Spatial Join tool is found in ArcToolbox > Analysis Tools > Overlay > Spatial Join.



The CCSM polygon layer will allow the GIS community to visualize and accurately represent the spatial distribution of the modeled climate projection data. Further, many GIS users will project the climate change data into a local projection system where the spatial area of each Gaussian grid cell will become distorted according the transformation method. The figures below demonstrate the CCSM polygons joined with a CCSM model projected climate variable on both the Gaussian grid and in a projected coordinate system.

CCSM Climate Data Polygons Across Europe - Guassian Grid



CCSM Climate Data Polygons Across Europe - Projected Coordinate Sytem

