UV-CDAT: Ultrascale Visualization – Climate Data Analysis Tools

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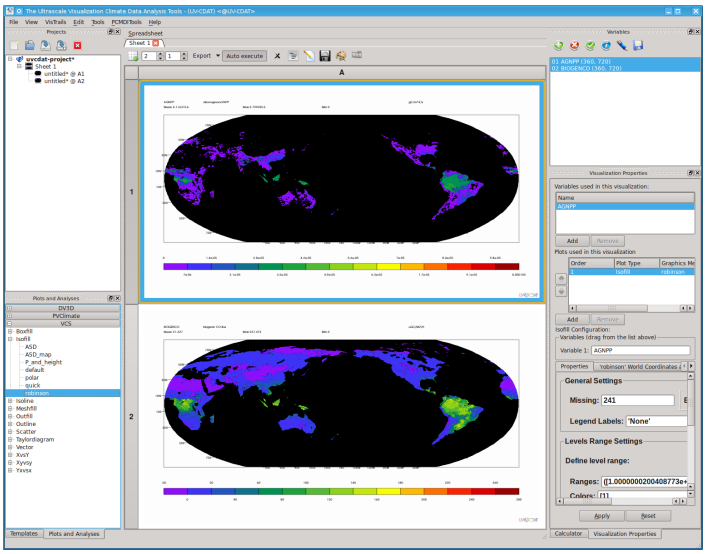
UV-CDAT Mission

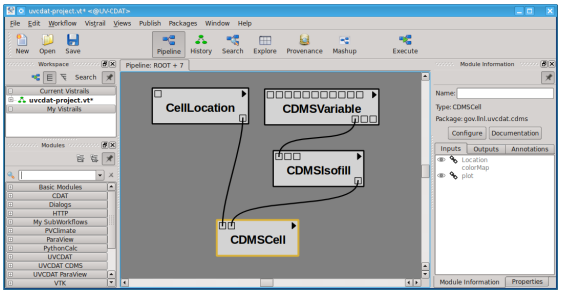
The purpose of the UV-CDAT project is to extend the existing Climate Data Analysis Tools to better support the larger, higher resolution datasets that are being generated by current climate models. UV-CDAT integrates Paraview, Vistrails and the CDAT tools into a single package.

New Graphical Interface



- Python based
- 'Drag-N-Drop' functionality
- Integration with VTK and Paraview for drawing
- Working on tighter integration with the supercomputers
- Working on integration with ESG

Automation & Provenance with VisTrails



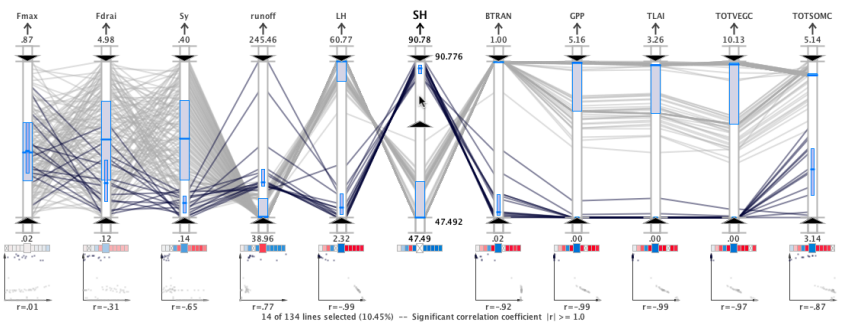
- Provides workflow and provenance management
- Vistrail automatically generated from the user's actions in the GUI.

Parallel Analysis and Visualization

- On-going improvements to VTK and Paraview to improve scalability and I/O performance on the supercomputers
- Modifications to Paraview to allow simultaneous rendering of multiple files in a time series
- Changing the I/O patterns to improve performance when hundreds of processes are working on the same file

EDEN

- Visualization of multivariate CLM4 simulation ensembles using parallel coordinates
- Dynamic visual queries for visual data mining
- Statistical analytics used to augment display to guide the scientist to the most significant associations
- Capable of visualizing any multivariate data set



This example shows the Harvard Forest ensemble data set of CLM4 parameters (3 leftmost axes) and outputs (8 rightmost axes). Each polyline in the plot represents an individual CLM4 model run.

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