

LLNL Climate

POP: December 31, 2016

Summary

The work done during this quarter includes enhancement and bug fixes to CDAT. As funding was not available during this quarter we only charged approximately 24 hours.

Bug fixes and enhancements to CDAT

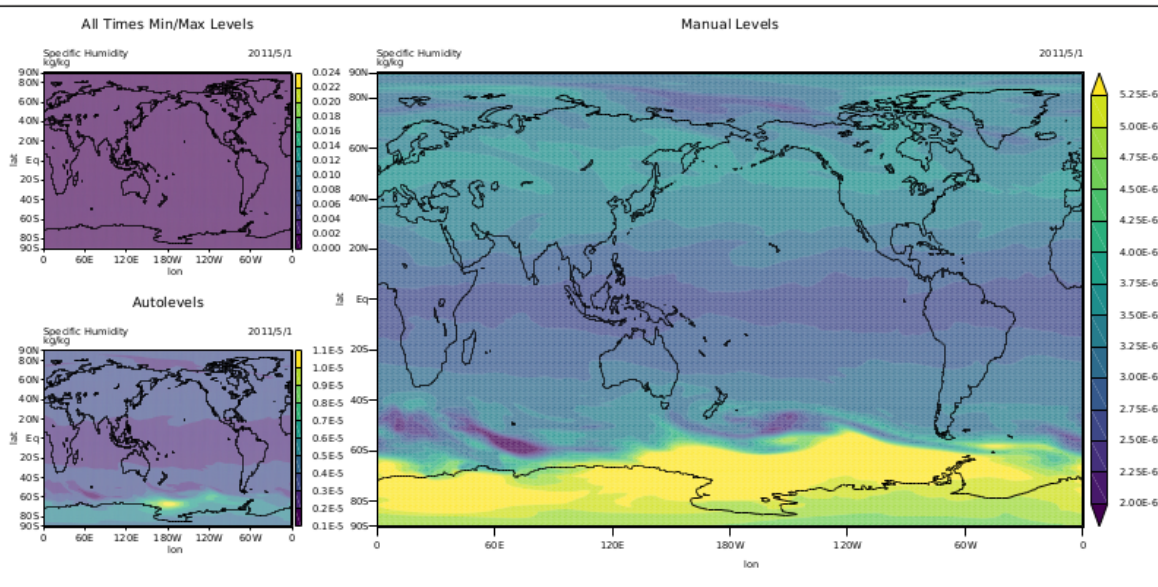
- Created test and merged fix for VTK export to PDF bug. Because of this bug, VCS could create an invalid PDF if using transparent text.

3-HEIGHTS™ PDF VALIDATOR ONLINE TOOL

You can use the form below to validate PDF files for PDF/A compliance.

File	text_bad.pdf
Compliance	pdf1.4
Result	Document does not conform to PDF/A.
Details	Validating file "text_bad.pdf" for conformance level pdf1.4 The content stream contains an invalid operator. The document does not conform to the requested standard. The document doesn't conform to the PDF reference (missing required entries, wrong value types, etc.). Done.

- Worked on an option to export vcs plots to PDF through matplotlib. VTK export to PDF is done through an external library called GL2PS. This library can generate PDF files that are too large or do not work with all PDF viewers. We investigate exporting VCS plots to PDF through the use of matplotlib library. Attached is a complex VCS plot exported to PDF through matplotlib.



Next quarter roadmap

- Update VCS to use the Context2D module. This enables zooming/panning in VCS plots as well as labels on the sides of the plot (and projected plots as well). The labels will be automatically updated as the user interacts with the plot.
- Upgrade VCS to use modern graphics hardware using VTK's OpenGL2 backend. This will significantly speed up rendering. This work requires the use of the Context2D module.
- Implement a streamlines plot. Currently we have vector plots but for more in depth understanding of direction and magnitude, streaming lines provides a much more compelling visualization.
- Measure execution time for VCS plots and identify cause for slow performance. Based on these findings, change code to improve performance. Possible improvement is to change VCS internals to make better use of VTK's pipeline architecture. This involves making sure that VTK objects are destroyed after use and moving certain VCS processings inside a vtkPythonAlgorithm. This will speedup VCS plots as rendering will be done only when needed. Currently updating various stages of the processing is done manually which results in duplicate work (in Animation for e.g.).