Dean N. Williams
Supported Projects: (AIMS, ESGF, UV-CDAT, ACME, PCMDI, DREAM, ASCAC)

Quarterly Report for July 1, 2016 – September 30, 2016

Quarter Accomplishments:

AIMS:

- Led and participated in daily, weekly, and monthly meetings and teleconferences for the following projects: ESGF, ACME, UV-CDAT, PCMDI, ASCAC, and DREAM **[July - September 2016]**.
- Led and participated in the interviewing/hiring process for two post-doc candidates and one potential FTE hire, to work within the AIMS group on the ACME, ESGF, and DREAM projects. The successfully chosen candidates select as new hires for the CASC and PLS job postings are:
  - Zhen Liu – Post-doc hire to start in October or November 2016
  - Sookyung Kim to start in January 2017
  - The FTE hire has a possible choice between my assignment and another assignment in PLS/AEED.
- Led or participated in NIH, DOE, NASA and NOAA workshops or meetings such as: the University Relations & Science Education outreach to UC Center for Planetary Health, LLNL-Georgetown University Bio-technology transfer; and the Infrastructure for the European Network for Earth System Modelling (IS-ENES2) program **[August 2016]**.
- Working with members of Livermore Computing (LC) to purchase long-term storage and computing required for ACME, PCMDI, UV-CDAT, and DREAM project development and production **[August 2016]**.
- Attended the DOE ASCR Next Generation Network for Science (NGNS) Principal Investigators' (PI) Meeting where, as PI, I presented the DREAM: Distributed Resource for Earth System Grid Federation (ESGF) Advanced Management project's advances and work for the FY16 and future work for FY17 **[September 2016]**.
- As a member of the Environmental System Science (ESS) data committee, I attended the DOE BER ESS Working Group: Data Management and Modeling Frameworks Workshop **[September 2016]**.
- As a committee member of the DOE Advanced Scientific Computing Advisory Board (ASCAC), I participated in the 2016 fall meeting. The meeting reviewed the DOE Office of Science Computational and Data science needs **[September 2016]**.
- Lead and participated in a series of AIMS white papers that were presented to the DOE BER program managers **[July - September 2016]**:
  - *Community Diagnostics Package*, a framework that integrates many of the community supported diagnostics and metrics projects, including the ACME Diagnostics Package, the PCMDI Metrics Package, the ARM Diagnostics Package, the NCAR Climate Variability Diagnostics Package, and many others;
  - *Usability and User-Interface Design*, to identify and develop usable solutions to bridge the gaps between multiple projects that facilitate scientific research with advanced web and computing applications—projects include ACME, PCMDI, ESGF, ESS, ARM, and many others;

- o *Community Data Analysis Tool for Windows*, broadening the climate community's ability to analyze and explore data under the Microsoft Windows operating system;
- o *Community Data Management System*, redesign and broaden the Climate Data Management System's scope to include newer "community" data file formats (such as HDF5 and IDX), the latest "community" Numerical Python packages (such as NumPy 3.0 and Numba), and the latest "community" of regridders that combine the manipulation of simulation, observation, reanalysis, and point data sets;
- o *Community Machine Learning*, to develop limited supervised and unsupervised feature learning by implementing existing high-performance computing (HPC) enabled deep featured learning algorithms for the Earth System Grid Federation (ESGF); and
- o *Analytical Data ecosystem Advanced Modeling (ADAM),* to develop and prototype the ESGF data ecosystem, including analyzing and predicting the completion of massive analysis, distributed scientific data collections that leverages distributed architectures and statistical methods designed for them.
- Led AIMS highlight slides for FY16; the slides were presented at the DOE Biological and Environmental Research (BER) program review of LLNL's Climate Program **[September 2016].**

ESGF:
- As a member of the ESS Executive Committee, I attended the ESS Executive Committee Workshop on Data Infrastructure that was held at DOE Headquarters in Germantown, MD, August 29-30, 2016. Attended the workshop remotely. **[August 2016]**
- Composed and delivered an "*ESGF User Satisfaction Survey*" to the ESGF user community. The survey responses will help improve our ESGF software stack and help us serve the community better in regards to data dissemination. It will also help the ESGF Executive Committee plan and prioritize software develop that more closely fit the communities' needs **[September 2016]**
- Planning the 6th Annual ESGF F2F Conference by soliciting and collecting abstracts for presentations and/or posters. The abstract are helping me develop the conference agenda **[July - September 2016].**

ACME:
- As a member of the DOE BER Accelerated Climate Modeling for Energy (ACME) council and the ACME Workflow and Data Management Group lead, I lead the "*2016 Overview and Highlights: Framework and Tools for Supporting Model Integration and Analysis*" presentation that was presented to DOE BER's management in review of LLNL's Climate Program. **[September 2016]**

Workshop Reports:

- Contributed to the workshop report entitled, "Towards a Shared ESS Cyber-infrastructure: Vision and First Steps"; the report was initiated from the ESS Executive Committee Workshop on Data Infrastructure held August 29-30, 2016 at the DOE Headquarters in Germantown, MD.

Papers:

- Eyring, V., Gleckler, P. J., Heinze, C., Stouffer, R. J., Taylor, K. E., Balaji, V., Guilyardi, E., Joussaume, S., Kindermann, S., Lawrence, B. N., Meehl, G. A., Righi, M., and **Williams, D. N.**, "Towards improved and more routine Earth system model evaluation in CMIP", Earth System Dynamics Discussion, doi:10.5194/esd-2016-26, 2016.

Proposals:

- LLNL AIMS request for the Community Data Analysis Tools (CDAT) proposal was approved for $500K/ year.
- LLNL AIMS request for white paper proposals were approved for $166K/year.

Next Quarter's Roadmap

- I will attend several meetings and workshops in D.C, including the 6th Annual ESGF Face-to-Face Conference **[October - December 2016].**
- I will continue to lead and/or participate in several daily, weekly and monthly meetings and teleconferences **[October - December 2016].**
- I will continue to lead AIMS, ESGF, UV-CDAT, ACME Workflow, DREAM, and other software development efforts **[October - December 2016]**.
- I will continue chair and participate on several review and advisory committees **[October - December 2016]**.
- I will continue to push for AIMS lead team white papers, including white papers on NumFocus, NASA DAACs integration, Provenance, OpenGIS, Community Monitoring.

Resources Required to Achieve Goals

- Clusters are needed for visualization development and server-side (remote) computing.