**Proposal Tentative Title:** Driving Data Preparation and Data Analysis On the Go

**PI/Co-Is/Collaborators:**

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Collaborators: TBD

**Solicitation Subtopic:** 1.2.3

**Concept Summary:**

Objective: We propose to develop web pages and mobile apps to facilitate data preparation and data analysis for NASA Earth Science modeling and model analysis communities. These tools will enable mobile devices, such as smart phones, tablets, and laptops, to drive model analyses on NASA observational data sets. The users can, from their mobile devices, select data sources (e.g., MODIS) and variables (e.g., cloud coverage), to conditionally sample the selected data in conjunction with other variables (e.g., SST in an air descending condition), to analyze the sampled data in various mathematically and statistically ways (e.g., zonal means of cloud water content profiles), and to visualize the analyzed results (e.g., variables projected to a world map). The observational data that would be supported by the proposed tools are (1) obs4MIPs datasets that are developed by NASA approved instrument science teams; and (2) research data products that the scientists on our team have generated from their collaboration with the modeling and model analysis communities. Because the expertise of our science team lies in using observational data for the atmospheric components of global circulation models (GCMs), the focus of the proposed tools will be to support analysis and visualization on the datasets for the atmospheric component (e.g., air temperature or aerosol). The proposed tools will also stimulate interest in Earth science research and applications, once put to the hands of college as well as K-12 students.

Approach: The proposed work will leverage our current project funded by the ROSES Earth Science CMAC program. The system being developed under CMAC is a set of online web services that enable multi-aspect physics-based and phenomenon-oriented climate model performance evaluation and diagnosis through the comprehensive and synergistic use of multiple observational data, reanalysis data, and model outputs. The system, named “PAWS-CMDA”, utilizes distributed parallel computing technologies in a multi-core cluster environment and is hence powerful in the backend. It is logical to enhance PAWS-CMDA’s user interface, especially for mobile device users, in order to unleash its full power. The focus of this proposed work will mainly be on two different but related aspects (1) Server side: modify current web page for automatic client detection and appropriate, efficient rendering on different monitors with various sizes and resolution. These include small screens with multi-touch (smart phones), medium screens with multi-touch (tablets), and large screens with keyboards and mice (laptops and desktops); and (2) Client side: develop mobile apps for devices running, e.g., iOS (iPhone and iPad) and Android (Samsung Galaxy) operating systems. These apps will take advantage the unique capabilities on mobile devices. For example, their mobility and ubiquity allow the users to check the status of their batch jobs anywhere anytime, or search the community for existing results; photo snapshots and text/audio notes allow them to record quick thoughts for future consideration or for idea sharing; GPS positioning enables a nearby local community, especially among students, to exchange findings and ideas. The end result of this proposed project will provide our users fast and responsive web services with a truly integrated experience across multiple devices.

**Technology Components/TRL**: PAWS-CMDA, TRL 6; html6, iOS SDK, Android SDK, all with TRL 8;

**Est Budget:** $300K yr1, $300K yr2