Research Scientist I
(Meteorologist)
15-110

The Boulder branch of the Cooperative Institute for Research in the Atmosphere (CIRA) at Colorado State University seeks to fill a professional scientific position for its collaborative research as a Cooperative Institute with the National Oceanic and Atmospheric Administration (NOAA) Earth System Research Laboratory (ESRL) Global Systems Division (GSD), for the NOAA Unmanned Aircraft Systems (UAS) program as part of the Sensing Hazards with Operational Unmanned Technology (SHOUT) program in Boulder, Colorado. (Work location will be in Boulder, Colorado).

Background:
Environmental data from satellites have become critically important to the delivery of accurate weather forecasts for the nation. This criticality has become so significant that potential gap in satellite environmental observations are expected to diminish the quality of the nation's events. The NOAA Unmanned Aircraft Systems (UAS) Program has designed a project focused on "Sensing Hazards with Operational Unmanned Technology" (SHOUT) to quantify the influence of UAS environmental data to high impact weather prediction and assess the operational effectiveness of UAS environmental data to high impact weather prediction and assess the operational effectiveness of UAS to help mitigate the risk of satellite observing gaps. Although environmental data collected by UAS cannot completely replace the global coverage of satellite data, the long endurance and long range of a Global Hawk UAS does provide new capabilities to reach and stay with high impact weather events.

In order to quantitatively evaluate the benefits of UAS data on mitigating a satellite gap, both Observing System Experiments (OSEs) and Observing System Simulations Experiments (OSSEs) are necessary. OSEs allow the evaluation of real data but cannot be used to analyze the impact of future observing systems. On the other hand, OSSEs provide a rigorous, cost-effective approach to evaluate the potential impact of new observing systems and alternate deployments of existing systems, and to optimize observing strategies. They are also used to prepare for the assimilation of new types of data, and to optimize the assimilation of existing data. OSSEs are an extension of OSEs, which use data denial experiments to determine the impact of existing observing systems. Atmospheric OSSEs determine the impact of new systems by performing data denial experiments that assimilate synthetic observations simulated from a realistic Nature Run (NR) stipulated to represent the "true" atmosphere.

The goal of this project is to conduct OSEs and OSSEs to evaluate the impact of current and potential environmental observations from instruments on the Global Hawk to mitigate a potential gap in satellite data. The work will make use of the NCEP's 3-dimensional variational (3DVAR) data assimilation system and will focus on weather events, including winter storms. The individual in this position will be a member of the Global Observing Systems Analysis (GOSA) Group of the NOAA/ESRL Global Systems Division (GSD).

Responsibilities:
The individual in this position is expected to work with the rest of the GOSA Group and to collaborate with scientists from the NOAA/GSD and the NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML) in Miami, Florida to lead OSSEs and OSEs with observations from instruments being considered to fly on the Global Hawk, including microwave, infrared and doppler precipitation radar capabilities. In addition, the individual in this position is expected to develop and optimize adaptive observation techniques for the NOAA UAS Program. More specifically, he/she is expected to support the project by conducting the following tasks:

- Conduct numerical weather analysis, prediction, and modeling experiments (including OSSEs and OSEs) with observations from instruments being considered to fly on the Global Hawk;
- Conduct data assimilation research with the NCEP's 3DVAR data assimilation system to incorporate the capability to assimilate observations from the Global Hawk;

- Assess impacts of targeted observations on high-impact weather events;
- Assist with development and testing of adaptive observation algorithms;
- Develop and test automatic software for adaptive observation algorithms to produce data sensitive areas and UAS flight patterns in (quasi) real-time environment;
- Calibrate and validate the numerical weather experiments results;
- Participate in other OSSE and OSE related tasks as needed

Required Qualifications:

- Ph.D. degree in Meteorology or related field
- Knowledge and experience in numerical weather prediction and meteorological analysis
- Knowledge of and experience with statistical analysis
- Experience in data assimilation
- Experience with Linux/Unix operating systems
- Knowledge of and experience with programming languages (Fortran-90 preferred) and scripting

Desired Qualifications:

- Experience with visualization packages
- Knowledge of adaptive observation techniques
- Demonstrated ability to work as part of a development team
- Ability to communicate effectively with researchers and other staff members

Salary: Commensurate with experience and qualifications.

Background Check:
Colorado State University is committed to providing a safe and productive learning and living community. To achieve that goal, we conduct background investigations for all final candidates being considered for employment. Background checks may include, but are not limited to, criminal history, national sex offender search, and motor vehicle history. In addition, the final candidate will be required to pass a federal Security Assurance Check because the job is in a federally occupied building.

Commitment to Diversity and Inclusion:
Reflecting departmental and institutional values, candidates are expected to have the ability to advance the Department's commitment to diversity and inclusion.

Application Deadline: Applications will be accepted until all positions are filled; however, to ensure full consideration applications should be submitted by April 5, 2015. Apply electronically by clicking “Apply to this Job” at the following website: http://jobs.colostate.edu/postings/8687. References will not be contacted without prior notification of candidates.

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