Research Scientist II
Model Evaluation and Observation Impact Assessment Research Scientist

The Cooperative Institute for Research in the Atmosphere (CIRA) at Colorado State University seeks to fill a professional scientific research position designed to conduct collaborative research with the National Oceanic and Atmospheric Administration (NOAA) located at the Earth System Research Lab (ESRL), Global Systems Division (GSD), Assimilation Development Branch (ADB) in Boulder, CO. **The office for this position will be in Boulder, CO at a federal facility and requires the ability to pass a National Agency Check with Inquiries (NACI, federal background check) for building access.**

**Description of Work Unit:**
The Cooperative Institute for Research in the Atmosphere (CIRA) at Colorado State University (CSU) is a multi-million dollar research organization located on CSU’s Foothills Campus in Fort Collins, Colorado. CIRA is a cooperative institute that is also a research department within CSU’s College of Engineering, in partnership with the Department of Atmospheric Science. Its vision is to conduct interdisciplinary research in the atmospheric sciences by entraining skills beyond the meteorological disciplines, exploiting advances in engineering and computer science, facilitating transitional activity between pure and applied research, leveraging both national and international resources and partnerships, and assisting NOAA, Colorado State University, the State of Colorado, and the Nation through the application of our research to areas of societal benefit. NOAA’s Global Systems Division (GSD) of the Earth System Research Laboratory (ESRL) is a federal science and research laboratory under NOAA’s Office of Oceanic and Atmospheric Research. GSD provides the National Weather Service (NWS) and the nation with environmental observing, prediction, computer, visualization, and information systems. These systems deliver data, forecasts, and predictions of weather, including severe weather events, within the next few minutes to weeks away. The Global Systems Division (GSD) of the Earth System Research Laboratory (ESRL) is a leader in the applied research, directed development, and technology transfer of environmental data, models, products, and services that enhance environmental understanding with the outcome of supporting commerce, protecting life and property, and promoting a scientifically literate public.

**Position Summary:**
The scientist will develop and use computer software to evaluate observation impacts within regional and global data assimilation / model predictions systems. Other work will include testing and evaluation of global model prediction systems, including data assimilation and model physics modules. The observation impact work will include contributing to community-based Forecast Sensitivity to Observation Impact (FSOI) systems (potentially including adjoint-based and ensemble-based FSOI methods). Observation sensitivities will be evaluated for many different observing systems, including conventional observations (rawinsonde, aircraft, surface observations), as well as satellite, radar, and other remotely sensed observations. This work will include testing and evaluation of the EMC global FV3-GFS system and Stand-Alone-Regional (SAR) versions of the FV3, as well as the GSI (Gridpoint Statistical Interpolation) and the Joint Effort for Data assimilation Integration (JEDI) data assimilation system. The scientist will work in collaboration with other scientists in ESRL/GSD, as well as the broader operational modeling community. The scientist will work as part of team in testing and refining algorithms for real-time operational application. This is a two-year position with the possibility of renewal. This position will be supervised by the CIRA Associate Director.

**Decision Making Statement**
The individual in this position executes a plan of research that resonates with the underpinning science objectives of the supporting projects. The decision he/she makes and the approaches he/she takes are determined by the individual’s own scientific acumen and in consultation with the Principal Investigator. Successful execution of the proposed research, i.e. supporting the deliverables mentioned in the project’s statement of work, hinges on the definition of a scientifically-sound plan and its execution. Ultimately this decision-making process lays a foundation that is critical for success in future proposals and builds an independent and self-sufficient research program. Similarly, the individual in this position conducts his/her research with an eye toward establishing strong partnerships with both CIRA research staff and sponsors.

**Essential Job Duties:**
Collaborative Research and Development 50%

- Plan and develop methods to evaluate and reduce forecast errors with the global FV3-GFS prediction system, including assessment of data assimilation and model physics aspects.
- Test and install improvements to the data assimilation system and model physics within the FV3-GFS global system to address identified issues.
- Plan and develop scientific methods to evaluate observation impacts for a variety of observing systems, including conventional and remotely sensed observations.
- Conduct comprehensive observation impacts assessments for the global FV3-GFS and regional FV3 systems and create reports summarizing results.
- Participate in group decisions about forecast errors and observations sensitivity issues within the global FV3-GFS and SAR FV3 forecast systems.

Tools Development 40%

- Develop computer software to evaluate observation impacts within regional and global data assimilation / model predictions systems
- Plan and develop computer software for a regional Forecast Sensitivity to Observation Impact (FSOI) system (potentially including adjoint-based and ensemble-based FSOI methods) and contribute code to a community FSOI repository.
- Participate in group discussions and activities associated with development and enhancement of regional and global FSOI systems.

Documentation and Reporting 10%

- Prepare software documentation in collaboration with other team members.
- Summarize research results for sponsors and broader scientific community,
- Prepare manuscripts for publication, based on these research results.

Required Qualifications:

- The office for this position will be in Boulder, CO at a federal facility and requires the ability to pass a National Agency Check with Inquiries (NACI, federal background check) for building access.
- Must be legally eligible to work in the United States by the proposed start date. CIRA will not sponsor a Visa for this position.
- Ph.D. in atmospheric sciences, mathematics, or a related field;
- Minimum 3 years relevant work experience;
- Experience with testing and evaluation of data assimilation and / or numerical forecast systems;
- Experience with variational and/or ensemble-based data assimilation systems;
- Experience running atmospheric prediction model systems (FV3, ARW, or other);
- Proficiency in UNIX-based scripting languages and workflow management systems;
- Ability to communicate effectively (verbal and written) and work effectively in a team environment.

Preferred Qualifications:

- Experience with use of FV3 numerical model system;
- Experience with use of GSI data assimilation system;
- Experience with variational or ensemble-based FSOI systems;
- Experience with the verification of global and regional meteorological forecasts;
- Understanding of statistical principles underlying meteorological data assimilation and assessment;
- Knowledge of Fortran and Fortran 90 including debugging and optimizing code;
- Knowledge of synoptic meteorology and forecasting experience;
- Experience maintaining robust community code in a real-time environment;
- High-performance computing (HPC) experience

Background Check:

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 11:59PM on May 5, 2019. Apply electronically by clicking “Apply to this Job” at the following website: [http://jobs.colostate.edu/postings/66252](http://jobs.colostate.edu/postings/66252). References will not be contacted without prior notification of candidates. Please be sure to address the required and preferred qualifications in the application materials.