The Cooperative Institute for Research in the Atmosphere (CIRA) at Colorado State University seeks to fill a full-time professional scientific position for its collaborative research and development as a Cooperative Institute with the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) Meteorological Development Laboratory (MDL) Decision Support Branch in Silver Spring, MD. **This position is located in a federal facility in Silver Spring, MD and requires the ability to pass a Tier One Background Investigation (federal background check) for building access.** *(Office will be in Silver Spring, MD; however, the option exists to telework up to three days per week from your home/office.)*

**Background:**
The primary goal in the research partnership between the Decisions Support Branch at the NWS MDL and CIRA has been to keep abreast of advanced technology and apply it to CIRA, MDL. The partnership is focused on providing technical expertise to MDL. MDL is responsible for developing and implementing scientific techniques into NWS operations to improve weather and environmental forecasts and services. MDL provides support to NWS field forecast offices, NCEP, and external customers nationwide.

**National Ice Center IMS System:**
The Interactive Multisensor Snow and Ice Mapping System (IMS) is an operational software package for monitoring snow and ice coverage. This software enables qualified OSPO analysts to look at images and products in order to make an informed decision as to snow and ice cover over the Northern hemisphere. The National Centers for Environmental Prediction (NCEP) relies on IMS for snow cover and lake cover initialization for the Global Forecast System (GFS), Climate Forecast System (CFS), N. American mesoscale Model (NAM) and Rapid Update Cycle (RUC) models. The RUC model also applies ice cover fields from the IMS for ice initialization. Therefore, the IMS operation can basically be broken down into four steps. First, the preprocessing system takes all products and imagery from their native formats and resolutions to project them into IMS set format and Secondly, IMS GUI system picks up the processed data from the preprocessing system at intervals throughout the day and displays the data on IMS projection. Thirdly, the analysts tag locations as snow covered and ice covered over the entire Northern Hemisphere. Last, the cron scripts on the IMS GUI system produce final products and distribute final products to proper destinations.

The IMS preprocessing system(s) were designed to provide input data to the IMS Graphical User Interface (GUI) machines that are used to analyze snow and ice over the Northern Hemisphere. This component will be transitioned to IDP by NCO team.

The IMS GUI is the interactive analysis steps needed as input into the final IMS product processing. The analyst must start the interactive GUI at a set time (after input data is received) and finish in an allotted time to allow final processing to take place and the product to be sent to users by the necessary time frame. The GUI’s main feature is to update the current analysis files which the cron scripts will use to then create the final products. This is the portion that MDL will be responsible for, and the IMS GUI needs to be implemented, probably under AWIPS2 framework.

**Storm Surge Modeling** explores ways to improve MDL’s storm surge guidance which is currently based on the Sea Lake and Overland Surges from Hurricanes (SLOSH) model and the Extra-Tropical Storm Surge (ETSS) model, which is an application of SLOSH to Extra-Tropical storms. To represent the modeled area, both SLOSH and ETSS rely upon bathymetry, topography and other geographic data mapped onto a computational grid (aka basin). Due to geomorphic changes and requirements for larger coverage, the basins are periodically updated and expanded. Those updates take advantage of advances in compute power and remote sensing allowing the models to be more detailed and accurate which results in more accurate simulations.

**Position Summary:**
The successful candidate will provide technical support to the Interactive Multisensor Snow and Ice Mapping System (IMS) operation and develop its Graphics User Interface (GUI) under the AWIPS2 framework. The IMS GUI will be used by analysts to visualize and adjust the ice and snow coverage and generate final products. The successful candidate will not
only develop the applications, but also collaborate with a variety of stakeholders. In addition to working on the IMS application, there may be opportunities to work on storm surge modeling as well. This position will report to the Sr Software Engineer/Architect.

**Responsibilities:**
Software Development 90%
- Development of the IMS Graphical User Interface (GUI) application to allow analyst to visualize the data on IMS projection and make the location analysis of snow and ice covered over the entire Northern Hemisphere.
- Provide knowledge and design expertise in IMS application development.
- Provide knowledge and expertise in developing IMS GUI application within the AWIPS.
- Transition development into operations.
- Coordinate with NWS and non-NWS agencies on requirements.
- Provide knowledge and expertise in developing and improving storm surge modeling.
- Develop and improve probabilistic results from ensemble runs (Probabilistic tropical cyclone storm Surge (P-Surge) and Probabilistic Extra-Tropical Storm Surge (P-ETSS)).

Documentation and Reporting 10%
- Prepare software documentation in collaboration with team members.
- Prepare status reports as required by the project sponsor and CIRA.
- Prepare and deliver technical talks and presentations as requested.

**Qualifications:**
Required
- This position is located in a federal facility in Silver Spring, MD and requires the ability to pass a Tier One Background Investigation (federal background check) for building access.
- A Bachelor’s degree or Master’s Degree in Computer Science, Meteorology, or related technical field and
- Ability to program in a variety of shell languages in a Linux environment.
- Experience with XML, C/C++, python, and Java
- Experience with manipulation of large gridded datasets at fine resolution in common data formats such as GRIB2, NetCDF, and HDF5.

Desired
- High degree of initiative, excellent communication skills, and applicable systems and software development experience
- Ability to function well as an effective member of a project team where adherence to design, coding, and other project conventions
- Experience working with IMS system
- Experience with IDL
- Experience with Storm Surge Models
- Experience supporting and maintaining large projects
- Familiarity with object-oriented concepts and design principles
- Experience working with relational databases such as PostgreSQL
- Experience developing software in a Linux, Windows, and/or Mac environment
- Experience troubleshooting issues
- Experience in the use of cloud computing services such as Amazon Web Services.
- Knowledge of operational meteorology, NWS operations, and NWS users
- Must be reliable, self-motivated, and comfortable working in an agile and creative team environment

**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. This position is
located in a federal facility in Silver Spring, MD and requires the ability to pass a National Agency Check with Inquiries (NACI, federal background check) for building access.

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.