Research Geographer/Physical Scientist

DEPARTMENT OF THE INTERIOR
Geological Survey

Responsibilities

The U.S. Geological Survey (USGS) serves as a national catalyst for the organization and distribution of biological, hydrological, geological, and geographical information and addresses the specific needs of the Department of the Interior and its land and resource managers. The USGS is the Nation's largest water, earth, biological science, and civilian mapping agency, working in cooperation with more than 2,000 organizations across the country with numerous international communities to provide reliable, impartial, scientific information to resource managers, planners, and other customers and partners.

The National Geospatial Technical Operations Center (https://www.usgs.gov/core-science-systems/ngp/ngtoc) (NGTOC) is the primary operational component within the National Geospatial Program (https://www.usgs.gov/core-science-systems/national-geospatial-program) (NGP), the largest program within the U.S. Geological Survey in terms of appropriated funding, with an annual appropriated budget of approximately $70 million. The NGTOC provides world-class geospatial technical expertise and customer service for the USGS and the Nation through fulfilling its responsibilities within the NGP. It is responsible for the acquisition, assessment, and integration of geospatial data in support of *The National Map*, oversight of Geospatial Data Products and Services Contracts, quality assurance and quality control of products and data produced via contract or by other entities outside of the NGTOC, providing government furnished materials to support contract production, development of national standards and data models to support The National Map, and providing technical assistance to USGS Geospatial Liaisons and state, local and private sector partners. The Research Geographer or Physical Scientist position is a member of the Center of Excellence for Geospatial Information Science (CEGIS) Section that is administratively within NGTOC. CEGIS is a national research capability conducting investigations to support The National Map, the National Spatial Data Infrastructure (NSDI), the 3-D Elevation Program (3DEP) and the emerging Geospatial and Semantic Web.

CEGIS conducts research that supports the mission of the NGP. The National Geospatial Programs include The National Map, US Topo topographic maps, the National Hydrography Dataset, the Watershed Boundary Dataset, the 3D Elevation Program, Geographic Names, and other supporting data themes of Transportation/Trails, Structures, and Boundaries. CEGIS research includes feature extraction from lidar, elevation, and imagery; generalization of geospatial data to support cartographic, geographic, and scientific uses; semantic modeling of topographic features to enable the map as a knowledge base; and application of machine learning and artificial intelligence in combination with high performance computing infrastructure to geospatial computations.

The Research Geographer or Physical Scientist position has an emphasis on the use of Artificial Intelligence computational methods such as Machine Learning, Deep Learning, and Neural Nets, in combination with High Performance Computing infrastructure and geospatial semantic representation to expand knowledge and solve problems related to Geospatial Sciences.

The incumbent reports directly to the CEGIS Section Chief in the Office of Innovation at NGTOC. The incumbent also collaborates with the CEGIS Director on annual and long-range research plans and objectives, both to support and refine the CEGIS 5-year vision. The CEGIS Section has approximately 5-10 researchers and support staff in the disciplines of cartography, geography, physical science, and computer science. This position will have oversight of at least one student contractor to provide direct project support.

As a Research Geographer or Physical Scientist within the National Geospatial Technical Operations Center, some of your specific duties will include:

- Identify, conduct, and collaborate on geospatial science research issues of national importance.
- Develop innovative methods of modeling and information synthesis, fusion, and visualization for physical science to improve our ability to explore geographic data and create new knowledge.
- Develop or adapt algorithms or programs for the geospatial sciences in combination with high performance computing infrastructure, to investigate solutions for extraction, generalization, visualization, modeling, and representation.
- Assess, influence, and recommend for implementation technological innovations for geospatial data and applications.
- Isolate and define specific projects; determine how the work can be accomplished; carry out objectives independently; formulate concepts and hypotheses; and perform theoretical analyses to predict performance characteristics.
- Serve as author or co-author on scientific peer-reviewed publications; prepare a research record for a peer review panel; and present research results at professional and scientific venues.

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