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IAEA
International Atomic Energy Agency

Job Description for Professional Posts

Reference:NA2024/24

Position and Grade:	Associate Isotope Spatial Analyst, P2
Organizational Unit:	Isotope Hydrology Section Division of Physical and Chemical Sciences
Duty Station:	Vienna
Type/Duration of Appointment:	FT – JPO, 1 year

Organizational Setting

The Department of Nuclear Sciences and Applications implements the IAEA's Major Programme 2, "Nuclear Techniques for Development and Environmental Protection". This Major Programme comprises individual programmes on food and agriculture, human health, water resources, environment and radiation technologies. These programmes are supported by laboratories in Seibersdorf, Monaco and Vienna. The Major Programme's objective is to enhance the capacity of Member States to meet basic human needs and to assess and manage the marine and terrestrial environments through the use of nuclear and isotopic techniques in sustainable development programmes.

The Division of Physical and Chemical Sciences is responsible for assisting and advising Member States in research and development for the nuclear sciences, especially the physical and chemical sciences. Specifically, the Division provides support to Member States in the following fields: production of radioisotopes and radiolabelled products for applications in health care and industry; radiation source applications; research reactor utilization; applications of accelerators and nuclear instrumentation; nuclear and atomic data for applications; controlled nuclear fusion and isotope hydrology and geochemistry.

The Isotope Hydrology Section is responsible for planning and implementing the IAEA's water resources programme. The programme assists Member States in the sustainable management of all aspects of their water resources, but with a particular focus on isotope hydrology. Major activities include internationally coordinated research, global isotope monitoring, capacity building, and technical assistance to Member States to help them with the assessment, development and use of water resources. The Section also operates a well-equipped laboratory for the analysis of stable and radioactive isotopes. The laboratory trains counterparts in using analytical techniques for high-quality measurements of isotopes in water samples.

Main Purpose

As a member of a team led by the Section Head, the Associate Isotope Spatial Analyst contributes to a results-oriented programmatic response to Member States' priorities in the application of nuclear technologies to meet their development goals related to water resources. The Associate Isotope Spatial Analyst is provided opportunities for practical exposure to programme development and execution in the scientific area of water resources management under the guidance of senior professionals.

Role

In close collaboration with the team, the Associate Isotope Spatial Analyst will develop, validate, and apply spatial models that employ machine learning and other tools for the prediction of isotope ratios in natural waters and other environmental isotope matrices. She/he will be responsible for the development of a harmonized benchmarking framework for isotope mapping and isotope-based geographic assessment methods using IAEA global isotope databases.

Partnerships

The Associate Isotope Spatial Analyst maintains professional contacts with IAEA scientific and technical staff and with external experts and stakeholders in nuclear techniques for water resources management. She/he will establish collaborative relationships with relevant member state institutions to support the use of isotope mapping techniques, including amongst counterparts of the IAEA's technical cooperation projects.

Functions / Key Results Expected

Under supervision of the Section Head and under the direct guidance of the responsible Professional staff member, the Associate Isotope Spatial Analyst carries out the following duties to address Member States' needs related to mapping and prediction methods for nuclear applications in water resources management:

- Review literature and create or adapt existing software code to establish a numerical toolset for isotope mapping methods to be used in the international science community (implementation in the R software environment).

- Carry out scientific research to support the evaluation and characterization of various isotope mapping algorithms, from classical geo-statistics, regression methods, to machine learning and artificial neural networks tools.

- Prepare a harmonized framework of analytical methods for isotope mapping and isotope-based geographic allocation and establish a common suit of benchmarking tools for the evaluation and quality assessment of such predictive modeling results.

- Investigate the feasibility of an international intercomparison exercise on isotope mapping and isotope-based geographic assignments, based on a common suit of IAEA data sets.

- Prepare such datasets excerpts (sub-sets) suitable for an intercomparison exercise and apply the necessary data cleaning and amendment.

- Contribute to the transfer of knowledge in support of IAEA technical cooperation projects, including (i) technical support and advise of counterparts, and (ii) facilitating the preparation of workshops and trainings on isotope mapping through our network of International Experts and Lecturers.

Competencies and Expertise (do not revise or edit)

Core Competencies		
Competence	**Occupational Role**	**Behavioural Indicator**
Communication	Individual Contributor	Communicates orally and in writing in a clear, concise and impartial manner. Takes time to listen and understand the perspective of others and proposes solutions.
Achieving Results	Individual Contributor	Takes initiative in defining realistic outputs and clarifying roles, responsibilities and expected results in the context of the Department/Division's programme. Evaluates his/her results realistically, drawing conclusions from lessons learned.
Teamwork	Individual Contributor	Actively contributes to achieving team results. Supports team decisions.
Planning and Organizing	Individual Contributor	Plans and organizes his/her own work in support of achieving the team or Section's priorities. Takes into account potential changes and proposes contingency plans.

Functional Competencies		
Competence	**Occupational Role**	**Behavioural Indicator**
Technical/scientific credibility	Associate	Acquires and applies new skills to remain up to date in his/her area of expertise. Reliably applies knowledge of basic technical/ scientific methods and concepts.
Analytical Thinking	Associate	Gathers and analyses information, identifying critical relationships and patterns among data and proposes workable solutions.

Expertise	
Expertise	**Description**
Environmental Data Analysis	Solid background in applied statistics, scientific programming, geo-statistics, numerical data analysis and database management. Expertise in machine learning techniques (clustering, decision tree learning, artificial neural networks, etc.).

Information Management	Good knowledge in mathematical and statistical techniques; tools such as R, Python; extracting and handling data from large data sets using SQL, PostgreSQL or other tools.
Hydrology	Experience in the use of environmental isotopes to assess hydrological and hydrogeological systems would be an advantage.

Education, Experience and Language Skills

- University degree in statistics, data sciences, geo-hydrology, environmental sciences, or related field.

- Minimum two years of relevant work experience in the area of geostatistical data analysis and / or machine learning tools, geo-hydrology, statistical modelling or mapping, at national or international level.

- Expertise in GIS and good knowledge in mathematical / statistical tools like R or Python.

- Experience in the application of isotope techniques for water resources management would be an asset.

- Experience in technical writing in English for producing and reviewing documents in the subject area.

- Excellent oral and written command of English. Knowledge of other official IAEA languages (Arabic, Chinese, French, Russian and Spanish) is an asset.