

Job Description for Professional Posts

Reference:NA2024/27

Position and Grade:	Associate Isotope Water Balance Modelling Officer, 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 Water Balance Modelling Officer 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. Associate Isotope Water Balance Modelling Officer 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

The Associate Isotope Water Balance Modelling Officer will support the team to develop and validate an isotope-enabled distributed hydrological model to quantify estimates of flow paths, volumes, and residence times of surface waters and groundwaters. She/he will liaise with prospective users of the model to assess transferability to water resource systems covering a range of climatic and hydrological settings and catchments.

Partnerships

The Associate Isotope Water Balance Modelling Officer 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 improve capability and expertise among Member States in the use of environmental isotopes in water balance modelling to better assess impacts of climate change on water resources availability and sustainability, 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 Water Balance Modelling Officer 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, online sources and previously developed modelling tools by the Section and Counter parts to assess suitability for further development or identification of alternative modelling approaches.
- Create or adapt existing software code to establish a distributed toolset for isotope-enabled water balance modelling to be used in the international science community (implementation in the Python, Java or R software environment with a link to the open data sources, e.g. using QGIS, Google Earth Engine).
- Apply a preliminary model uncertainty analysis to constrain the potential limits of the modelling outputs.
- Carry out scientific research to support the evaluation and characterization of various isotope-enabled water balance and hydrological models.
- Prepare a preliminary harmonized framework of analytical methods for isotope-enabled water balance modelling and establish an initial common suite of benchmarking tools that could be used for the evaluation and quality assessment of modelling results.
- Contribute to the transfer of knowledge in support of IAEA technical cooperation projects, including (i) development of minimum technical support requirements to counterparts, and (ii) formulation of workshops and training courses on isotope-enabled water balance modelling.

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 Modelling	Solid background in hydrological modelling, scientific programming, geo-statistics, numerical data analysis and database management. Possess strong coding skills in at least one of Java, Python, C++ or R-coding. Have modelling experience over large spatial scales. Be familiar with numerical modelling and model uncertainty analysis approaches such as GLUE.

Information Management	Good knowledge in hydrology and mathematical techniques; extracting and handling data from large data sets. Have experiences of coupling different models (e.g., a land surface model with a hydrological model). Be able to handle and analyse large datasets.
Hydrology	Experience in the use of environmental isotopes to assess hydrological and hydrogeological systems would be an advantage. Experience with constraining different hydrological signatures within individual study catchments.

Education, Experience and Language Skills

- University degree in numerical modelling, hydrology, statistics, data sciences, geo-hydrology or related field.
- Minimum two years of relevant work experience in the area of hydrological modelling, geostatistical data analysis and / or statistical modelling at national or international levels.
- Expertise in GIS and good knowledge in mathematical / statistical tools like Java, 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.