Candidate Information Booklet

IRC278954

Geospatial Analyst – Carbon Stock Estimation in Above Ground Biomass

Agri-Food and Biosciences Institute Northern Ireland (AFBI)

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Communication between HRConnect and you

HRConnect will issue electronically as many competition communications as possible, you should therefore check your email account to make sure that you don't miss any important communications in relation to this competition. There may, however, still be a necessity to issue some correspondence by hard copy mail.

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BACKGROUND

ABOUT THE AGRI-FOOD AND BIOSCIENCES INSTITUTE

AFBI is a non-departmental public body sponsored by DAERA and a leading provider of scientific research and services to government, non-governmental organisations and commercial companies.

In line with AFBI's vision of "Advancing the local and global agri-food sectors through scientific excellence." the Institute seeks to be an influential, internationally recognised, centre for research and scientific services in the agri-food and marine sectors, providing high quality and locally relevant science. Our current Corporate Plan for 2018-22 sets out our aims to deliver for society, the economy and the environment, and to meet the needs of customers and partners in an ever more efficient and effective manner. To achieve these aims, our Corporate Plan also outlines how we, with the support of our sponsoring department, plan to invest in our people and infrastructure to provide innovative, efficient and effective service delivery. These plans include an ambitious programme of capital investment in AFBI's infrastructure including a new animal health sciences building at AFBI Stormont, improved research farm facilities at AFBI Hillsborough and a replacement sea-going research vessel.

As the Northern Ireland government's main research and statutory testing provider in the areas of agri-food, fisheries and the environment, AFBI plays a major role in the Northern Ireland knowledge economy. AFBI's scale, relationships with a wide range of international research organisations and close links with local universities and industry mean that it is ideally placed to carry out research that has both global and local impact. AFBI's science is outcome-driven and aimed at solving important practical problems for a wide range of local, national and international funders in the public and private sectors. Our staff carry out world class scientific research, surveillance, and analytic and diagnostic testing for a wide range of customers in the fields of animal health and welfare, sustainable agricultural systems, plant science, food innovation and safety, environmental protection, fisheries and aquatic ecosystems, and agricultural and rural economics.

AFBI's main work areas are aimed at leading improvements in the agri-food industry; protecting animal, plant and human health; and enhancing the natural and marine environments. We have a staff complement of approximately 650 people, with an annual turnover of approximately £60 million. Details of AFBI's most recently published income and expenditure are available on its website.

AFBI is located on seven sites across the province, with its headquarters at Newforge Lane, Belfast.

AFBI SITES ACROSS NORTHERN IRELAND
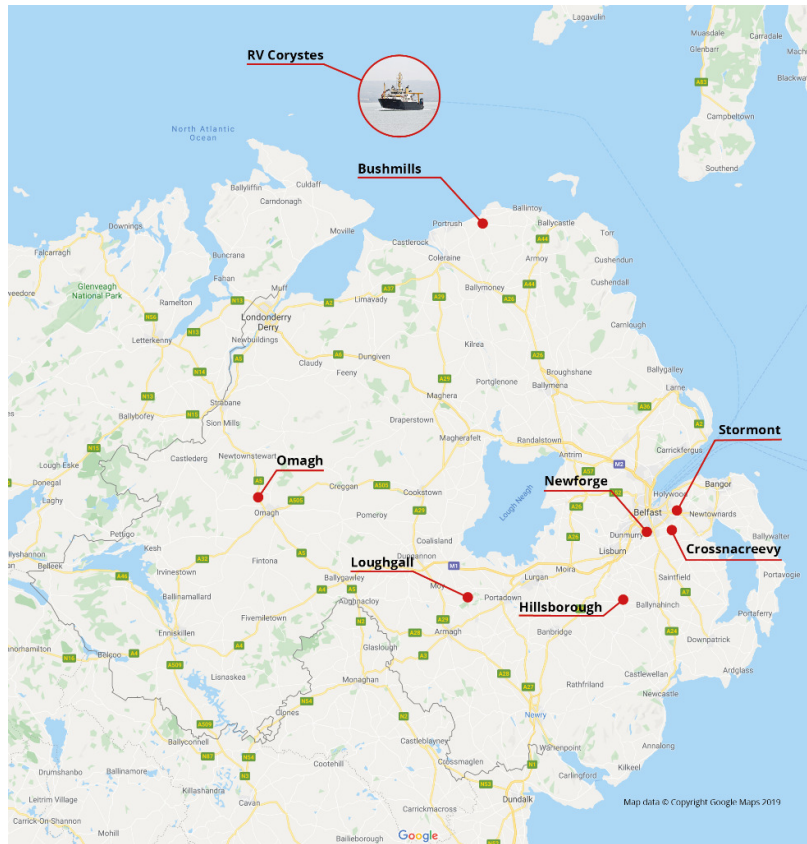
AFBI has 7 sites across Northern Ireland

- Newforge Lane (Headquarters)
- Stormont
- Hillsborough
- Crossnacreevy
- Loughgall
- Omagh
- Bushmills

In addition a 53 m dedicated marine research vessel RV Corystes based in Port of Belfast.

AFBI's science activities are organised across 3 divisions – Environment and Marine Sciences Division (EMSD), Sustainable Agri-Food Sciences Division (SAFSD) and Veterinary Science Division (VSD) with Finance and Corporate Affairs Division (FCAD) delivering on Business needs.

ENVIRONMENT AND MARINE SCIENCES DIVISION (EMSD)

EMSD is a new science division, which has been established following a review of AFBI's organizational structure. It comprises of two areas, which have in recent years been part of the Sustainable Agri-Food Sciences Division. The areas of work which will fall within EMSD currently have approximately 120 scientific, technical and support staff.

The decision to establish this new division reflects the increasing importance and amount of scientific work undertaken by AFBI in the agri-environment, marine and aquatic ecosystems areas. The division will focus on evidence based science, which is key to addressing the significant environmental challenges whilst ensuring the sustainable use of natural resources and the future prosperity of the agri-food sector. The division is in a unique position to delivery on a high impact and quality integrated programme of research spanning from the soil to the sea.

Key actors within EMSD represent:

Agri-Environment Branch - which interfaces between intensive livestock production, and environmental management and regulation which includes the impacts of agricultural land use practices on soil, water and air and identify ways of optimizing land-based livestock production.

Fisheries and Aquatic Ecosystems Branch who conduct research and development, monitoring and technology transfer in the area of marine fisheries stock assessment, coastal zone science, biological oceanography, marine ecosystem health, and freshwater fisheries stock assessment.

AGRI-ENVIRONMENT BRANCH

Agri-Environment Branch (AEB) is one of two Branches within the Environment and Marine Sciences Division (EMSD). The aims of the Branch are to develop and sustain an integrated research effort with national and international recognition on nutrient management within agricultural systems, focusing particularly on the needs of Northern Ireland, thereby

- Developing sustainable practices within a competitive industry
- Providing a scientific basis for government policy and
- Enhancing the quality of the environment.

Environmental research in the Branch addresses land and nutrient management issues to make appropriate and efficient use of resources, while protecting the environment. The integrated research effort covers the impact of agriculture on air, soil, water quality and biodiversity. The outputs of this research have provided much of the scientific basis for the development of the Action Plan for Northern Ireland to comply with the Nitrates Directive and Derogation, Phosphorus Regulations and Water Framework Directive. The Branch undertakes basic, strategic and applied research for DAERA and other government departments and agencies, as well as commercial organisations.

Research programmes are in place within the Branch to address issues affecting the Northern Ireland Agri-food industry in relation to nutrient use efficiency, water quality, soil health, biodiversity, ammonia and greenhouse gas emissions, bioenergy and the circular economy.

Our research is currently delivered via five research programmes:

1. Air Quality & Climate Change
2. Catchment Sciences
3. Sustainable Soil Management & Crop Nutrition
4. Soil Biogeochemistry & Terrestrial Ecology
5. Agri-Environmental Technologies.

JOB DESCRIPTION

An exciting opportunity currently exists within AFBI for one **permanent**, **full-time** Higher Scientific Officer (HSO) to conduct research in the area of carbon capture in above ground biomass. This role will initially be based within the carbon inventory component of DAERA's Soil Nutrient Health Scheme (SNHS), an ambitious project aiming to assess baseline carbon and soil nutrient status for all Northern Ireland's agricultural land by 2026.

The post will support geospatial research within Agri-Environment Branch, specifically in the areas of agriculture and soil science where modelling skills are required to undertake LiDAR-based estimation and mapping of above ground biomass (AGB) across multiple projects. Work will involve the use of advanced GIS applications and modelling (working primarily, but not exclusively, with ESRI ArcMap software), coding in both Python and R, advanced data processing and the integration, analysis and interpretation of large and complex data sets.

The objectives of the SNHS are to soil nutrient test the 700,000 fields used for farming in Northern Ireland, and thus provide unique region-wide baseline information and mapping of soil nutrient status at field, farm, and catchment scales, and for different enterprise types. All participating farmers will be provided with nutrient and lime recommendation maps appropriate for all crops on all soil types, including basaltic soils. They will also receive nutrient runoff risk maps based on modelling of runoff prone areas using LiDAR elevation data sets and soil data. With specific reference to this post, the Scheme will provide estimates of soil carbon stock in each sampled field and estimates of carbon in above ground biomass in trees, hedgerows and woodlands (model-predicted from newly acquired LiDAR data) for the entire agricultural area of Northern Ireland. Information will also be generated on rates of soil C sequestration (involving radio-carbon dating and soil microbiological assessments) in grassland fields on selected commercial farms and along undisturbed field boundaries on different soil types, and this information will be used to help update the UK soil carbon inventory and to identify management strategies which enhance carbon capture by soil and above ground biomass. This unique dataset will be used to develop strategies for improving the sustainability of the region-wide soil resource, agriculture and the natural rural environment - with particular emphasis on vulnerable terrestrial and aquatic ecosystems.

A reserve list will be created and will be held for a period of 12 months from the date of interview, to cover any further vacancies which may arise.

Salary

Salary will be within the range £32,328 - £ 33,459 and pay increases will be on an incremental basis provided staff performance reports are satisfactory.

Starting salary will normally be at the minimum of the scale except for existing AFBI staff for whom starting salary may be determined by either promotion or re-grading terms if these are more favourable.

Annual Leave

In addition to the usual public and privilege holidays, there is an annual leave allowance of 25 days, increasing to 30 after five year's satisfactory service.

Working Hours

The successful candidate will normally be required to work 5 days each week, totalling 37 hours. On occasions the duties may include some evening and weekend working. AFBI operates a flexi working system.

Location

The successful candidate will be based at AFBI Headquarters, Newforge Lane, Belfast, BT9 5PX, however, they may, on occasion, also be expected to work at other sites in Northern Ireland as required

Travel

The post may entail some travel locally, nationally and internationally and for this reason the successful applicant will require access to a form of transport which will permit them to meet the requirements of the post in full.

Training

Appropriate training will be provided, where required, to enable the successful candidate to carry out the full range of assigned duties.

Medical

The successful candidate will be asked to complete a health declaration questionnaire and may be invited to attend a medical examination to confirm that they are fit to carry out the physical duties of the post.

Probation

The post holder will serve 12 months probation in the new post. This will commence from the date of appointment. At the end of the probation period a formal review will be conducted to determine if the posting will be made permanent.

Further Information

Applicants wishing to learn more about the post before deciding to apply may email AFBI HR at workforceplanning@afbini.gov.uk.

If you have any questions about the competition process, you should contact HRConnect on 0800 1 300 330 or email recruitment@hrconnect.nigov.net.

KEY RESPONSIBILITIES

The post holder will initially work within the carbon inventory component of DAERA's Soil Nutrient Health Scheme (SNHS) which will deliver LiDAR-based estimation and mapping of AGB (hedgerows, single trees, woodland) across all farmed land in Northern Ireland.

AGB Estimation

The post holder will use high resolution LiDAR data (and other supplementary datasets) to model and estimate AGB within a GIS framework which will include use of ArcMap, ArcScene and ArcPro and other open source equivalents. Experience with model development in GIS and coding compatible with geospatial software (i.e. Python and/or R) will be essential, as will the capacity to;

- edit and correct geospatial data sets
- filter and process raw LAS files to a variety of classifications
- integrate multiple and diverse data sources (e.g. soils, land use, satellite imagery, and GPS datasets).

The post holder will be expected to engage with and contribute to the research components of this work programme, to refine and develop the modelling approach to the diverse landscape of Northern Ireland. Practical field knowledge and experience in the area of biomass measurement will be required to undertake validation and interpretation of the outputs.

Geospatial data management

The post holder will be responsible for geospatial data management (quality control, organisation, archiving, processing and analysis). They will routinely manipulate and integrate diverse geospatial data sets including soils, land use, GPS records, satellite (multispectral) imagery, drone imagery/photogrammetry and land parcel data sets at catchment to national scales. Furthermore the post holder will contribute to the development of data outputs into accessible decision support for farm stakeholders.

Report writing

It will be the responsibility of the post holder to prepare written research reports as required through the lifetime of projects they are involved in. They will also contribute to the preparation of peer review publications and conference presentations. In addition they will be expected to participate in knowledge transfer and outreach activities that will include farm liaison, social media platforms and meetings with stakeholders, including DAERA policymakers.

Resource and staff management

The post holder will oversee administrative activities directly relating to their post including procurement, budget management, and servicing and

maintenance contracts. They will manage and distribution tasks to their sub-team and report to senior management on a regular basis.

Other Duties

The post holder will be required to fulfil any other duties and responsibilities as determined by management that fall within the remit of the post. The job description should be regarded as working guidelines within which the post holder will work, they are not intended to be rigid and inflexible.

This list is not exhaustive and the successful candidate will be required to carry out other duties as allocated by management.

ELIGIBILITY CRITERIA

Applicants must have, by the closing date for applications, have:

1a. A post-graduate qualification (MSc/PhD) in environmental science, physical geography or geo-informatics or a related discipline.

OR

1b. Degree in a relevant scientific discipline and 3 years post graduate experience in environmental science, physical geography or geo-informatics or a related discipline.

AND

2. A minimum of three years' post graduate experience in Geographic Information Systems (GIS) in environmental applications, to include ESRI ArcMap software or open source equivalents. Demonstrable experience in model development in GIS and coding in Python and/or R.

3. A minimum of two years' experience in geospatial analysis and modelling relating to large environmental data sets including the use of LiDAR to model/estimate and map above ground biomass in hedgerows/trees/woodlands.

4. A minimum of two years' post graduate experience in scientific data management – to include familiarity and competence with electronic data using spreadsheets, database packages and GIS.

Applications will also be considered from applicants with relevant formal qualifications considered by the selection panel to be of an equivalent or higher standard to those stated.

Relevant or **equivalent** qualifications: give the type of qualification and date awarded (the date awarded is the date on which you were notified of your result by the official awarding body). If you believe your qualification is equivalent to the one required, the onus is on you to provide the panel with details of modules studied etc so that a well-informed decision can be made.

SHORTLISTING CRITERIA

In addition applicants should be aware that after an eligibility sift, should it be necessary to shortlist candidates to go forward to interview, the following shortlisting criteria will be used in the order listed:

1. Demonstrable experience of fieldwork and techniques associated with the quantification and measurement of AGB.

Please note:

- **You should ensure that you provide evidence of your experience in your application form, giving length of experience, examples and dates as required.**
- **It is not sufficient to simply list your duties and responsibilities.**
- **The panel will not make assumptions from the title of the applicant's post or the nature of the organisation as to the skills and experience gained.**
- **If you do not provide sufficient detail, including the appropriate dates needed to meet the eligibility criteria, the selection panel will reject your application.**
- **ONLY the details provided by you in your application form (the employment history and eligibility criteria), including any bibliography section, will be provided to the selection panel for the purpose of determining your eligibility for the post.**
- **The panel may decide to interview only those applicants who appear, from the information available, to be most suitable in terms of relevant experience and ability.**

PERSON SPECIFICATION

Candidates will be expected to demonstrate the skills and competencies set out in the eligibility criteria and shortlisting criteria. In addition, they will also be required to demonstrate the skills and competencies set out in the Northern Ireland Civil Service (NICS) competency framework at Level 3 for the purposes of personal and professional development.

Higher Scientific Officer is analogous to Staff Officer in the NICS.

What is the NICS competency framework?

The competency framework sets out how all NICS employees should work. It puts the Civil Service values of integrity, honesty, objectivity and impartiality at the heart of everything they do, and it aligns to the three high-level leadership behaviours that every civil servant needs to model as appropriate to their role and level of responsibility: Set Direction; Engage People and Deliver Results. Competencies are the skills, knowledge and behaviours that lead to successful performance. The framework outlines ten competencies, which are grouped into three clusters. The competencies are intended to be discrete and cumulative, with each level building on the levels below i.e. a person demonstrating a competency at level 3 should be demonstrating levels 1 and 2 as a matter of course.

The Northern Ireland Civil Service competency framework can be accessed through www.nicsrecruitment.org.uk

It is important that all candidates familiarise themselves with the competency framework as this forms the basis of the assessment / interview criteria as outlined below.

INTERVIEW CRITERIA

In addition to satisfying the eligibility criteria and shortlisting criteria applicants will also be expected to display the following qualities and skills at interview:

Presentation

Before the competence based interview, candidates will be required to deliver a presentation, lasting no more than 7 minutes, the subject of which will be provided to candidates in the invitation to interview letter.

Candidates should fully prepare their presentation in advance of the interview and no preparation time will be provided on the day of interview. Your presentation should be delivered via PowerPoint and you will be asked to submit it to HRConnect by a specific date prior to your interview. Full details will be provided should you be invited to interview.

Following the presentation, the panel may elect to ask questions on the presentation.

The presentation will be used to assess against the **Professional/Specialist/Technical Ability** competency.

1. Professional/Specialist/Technical Ability

- Develops and updates professional/specialist/technical knowledge and skills to meet objectives and improve performance; demonstrates an in-depth knowledge and understanding of current developments and best practice.
- Applies knowledge and skills in the collection, collation, manipulation, analysis and interpretation of scientific data.
- Applies knowledge and skills in writing scientific papers and technical reports.

Marks available: 80   Minimum standard: 48

2. Making Effective Decisions

Being objective, using sound judgement, evidence and knowledge to provide accurate, expert and professional advice. Showing clarity of thought, setting priorities, analysing and using evidence to evaluate options before arriving at well-reasoned, justifiable decisions.

Marks Available: 10

3. Leading and Communicating

Communicating with clarity, conviction and enthusiasm, both orally and in writing.

Marks Available: 20   Minimum standard: 12

4. Managing a Quality Service

Make effective use of project management skills and techniques to deliver outcomes.

Marks Available: 10

5. Collaborating and Partnering

Create and maintain positive, professional and trusting working relationships with a wide range of people.

Marks Available: 10

6. Delivering at Pace

Delivering timely results and taking responsibility and accountability for quality outcomes.

Marks Available: 20   Minimum standard: 12

Total Marks Available: 150
Overall Pass Mark: 90

COMPETENCE BASED INTERVIEWS

Selection panels will design questions to test the applicant's knowledge and experience in each of the above areas and award marks accordingly.

INTERVIEWS

It is intended that interviews for this post will take place in AFBI HQ, Newforge Lane, Belfast during August 2022.

Candidates should note that due to current circumstances with COVID 19, social distancing measures will be put in place. If this is not possible the use of video technology may be used as an alternative.

COMPETENCE BASED INTERVIEWS

Selection panels will design questions to test the applicant's knowledge and experience in each of the above areas and award marks accordingly.

INTERVIEW GUIDANCE FOR APPLICANTS

If this is your first experience of a competence-based interview, bear in mind that it does not require you to:

- Talk through previous jobs or appointments from start to finish;
- Provide generalised information as to your background and experience; or
- Provide information that is not specifically relevant to the competence the question is designed to test.

A competence-based interview does however require you to:

- Focus exclusively, in your responses, on your ability to fulfill the competences required for effective performance in the role; and
- Provide specific examples of your experience in relation to the required competence areas.

In preparation for the interview you may wish to think about having a clear structure for each of your examples, such as:

- Situation – briefly outline the situation;
- Task – what was your objective, what were you trying to achieve;
- Action – what did you actually do, what was your unique contribution;
- Result – what happened, what was the outcome, what did you learn.

The panel will ask you to provide specific examples from your past experience in relation to each of the competences. You should therefore come to the interview prepared to discuss in detail a range of examples which best illustrate your skills and abilities in each competence area. You may draw examples from any area of your work / life experiences.