

# PhD position in Earth observation techniques for peatland monitoring

The research groups of Prof. Sébastien Lambot ([Université catholique de Louvain](https://www.uclouvain.be/)) and Prof. Frieke Van Coillie ([Ghent University](https://www.ugent.be/)) are looking for a highly motivated student to start a PhD in the field of Earth observation techniques for peatland monitoring.

## The project

The PhD position is embedded into the 5-year project “EO4PEAT” funded by the Belgian Earth Observation programme (<https://eo.belspo.be/en/stereo-iv-programme>). In EO4PEAT, an international team of four Belgian research groups and two international partners will develop novel techniques for the monitoring and modeling of peatlands, in particular over the tropics, by exploiting the information from available Earth Observation (EO) data. The conducted research is of high societal interest since peatlands are the most carbon-dense ecosystems on Earth and pose the risk of becoming global hotspots of carbon dioxide emissions after climate change or direct human disturbance. In this regard, EO4PEAT focuses on two key tropical regions of major global concerns: The Southeast Asian peatlands due to the huge extent of Land Use and Land Cover Change (LULCC) over the last decades and the Congo basin peatlands in the Cuvette Centrale due to their high vulnerability to climate change and the anticipated immense increase of land use pressures and human disturbances. In both areas, there is an urgent need for action to preserve and/or restore the peatland ecosystem functions and unique biodiversity. The information from high-quality satellite-based monitoring products can significantly support ongoing climate change mitigation activities. EO4PEAT is committed to disseminating research outcomes through peer-reviewed publications in highly-ranked journals and presentations at notable international conferences.

## Job description

The PhD position of this announcement has three main objectives:

- 1) Development of an advanced monitoring of hydrological conditions in tropical peatlands using different types of freely-available satellite and ground-based radar observations: the development will be built upon a physics-based electromagnetic retrieval algorithm supported by Artificial Intelligence (AI) components.
- 2) Development of a near real-time monitoring of LULCC for tropical peatlands based on fully convolutional neural networks and several types of freely-available satellite observations: the proposed algorithm will make use of newest AI developments to optimally capture spatial and temporal features in the EO data.
- 3) Improving the understanding of the two-way interaction between LULCC and hydrological

conditions in tropical peatlands: This understanding can be used by stakeholders involved in peatland protection, restoration and management.

The PhD student will closely collaborate with the EO4PEAT project team composed of professors, senior scientists, and PhD and MSc students, in Belgium, the Democratic Republic of Congo and Singapore. The PhD student will obtain a joint PhD degree from the Université catholique de Louvain and the Ghent University. The duration of the position spans 4 years, full-time working schedule.

The successful PhD candidate will be responsible for conducting and communicating high-quality research through publications and presentations, both within the research team and to external audiences. Additionally, training will be provided to enhance these communication skills via the Doctoral Schools. Beyond the research responsibilities, the selected candidate will also take on supplementary roles, including teaching and conducting seminars for students (partial requirements accounted for receiving a PhD degree).

## Job profile

- Excellent motivation and grades
- Master in Bioscience Engineering, Civil or Environmental Engineering, Hydrology, Geography, Geosciences, Meteorology, Remotely Sensed Earth Observation, Physics, Mathematics, Computer Sciences or equivalent
- Experience with data-processing applications such as Matlab, Python, IDL, R, or other
- Experience with programming and scientific computing
- Creative, critical, analytical and innovative mindset
- Ability to work independently
- Excellent written and oral communication skills in English

Only PhD candidates with grades above average can be admitted to the Doctoral Schools.

## Job offer

- Fully funded PhD scholarship for 4 years; support and training through the Doctoral Schools of the Université catholique de Louvain and the Ghent University
- Involvement in top-notch research on a topic of global relevance
- Multi-disciplinary research in an international professional environment

## Interested? How to apply?

We encourage applications from individuals who believe they meet the key qualifications outlined above. You can apply for this job no later than February 05, 2024 by sending your resume, including study grades, and a motivation letter to [sebastien.lambot@uclouvain.be](mailto:sebastien.lambot@uclouvain.be). Additionally, include the names and contact information of two references.

The planned starting date is April 1st, 2024 though a postponement by a maximum of three months can be negotiated. For more information, please contact [sebastien.lambot@uclouvain.be](mailto:sebastien.lambot@uclouvain.be) or [frieke.vancoillie@ugent.be](mailto:frieke.vancoillie@ugent.be).

UCLouvain and UGent seek to foster an environment where all talents can flourish, regardless of gender, age, cultural background, nationality or impairments. If you have any questions relating to accessibility or support, please contact us at [diversiteiteninclusie@ugent.be](mailto:diversiteiteninclusie@ugent.be).