

Learning Agreement for Traineeships

Academic year (year/year)

Details of the student¹

First and last name:	Emilio Kenda
Date of birth:	03/03/2001
Nationality:	Ecuador
E-Mail:	emilio.kenda@unine.ch
Home institution:	Université de Neuchâtel
City, country:	Neuchâtel, Switzerland
Faculty, department or study programme:	Sciences
Study level and Subject area:	2nd year, Master in Hydrogeology and geothermics

Details of the proposed mobility

Host institution/organisation:	Escuela Politécnica Nacional
City, country:	Quito, Ecuador

Planned dates of start and end of the mobility period: from 07.04.2025 till 09.06.2025

Knowledge, skills and competences to be acquired:

Upon completion of this project, the student should gain a deeper understanding of the hydrogeology of volcanic island formations by developing expertise in modeling hydrogeological systems.

Detailed programme for the project/training period:

Objective:

The project focuses on developing a hydrogeological model of the Cerro Gato watersheds in San Cristobal to better characterize the transient hydrodynamic behavior of the perched aquifer.

Work Plan

Phase 1: Literature Review & Data Collection (most of this phase should be performed previous to the student training period)

- Review existing studies on hydrogeology of basaltic islands and perched aquifers.
- Review the hydro-climatological data available.
- Review and analyse resistivity data from the 3D TDEM airborne survey to understand the internal structure of the system.

¹ This document uses gender-neutral language.

Deliverable: Literature review report and database of collected data.

Phase 2: Conceptual Model Development (most of this phase should be performed previous to the student training period)

- Develop a conceptual model of the hydrogeological functioning of the watershed.
- Identify key parameters influencing groundwater flow (permeability, porosity, recharge rates).
- Define the interaction between unsaturated and saturated zones.

Deliverable: Conceptual model report with visual schematics.

Phase 3: Numerical Model Construction

- Implement the conceptual model into a numerical modeling software (e.g., MODFLOW, FEFLOW).
- Calibrate the model using available data (precipitation-response analysis).
- Simulate water flow in unsaturated and saturated zones at the watershed scale.

Deliverable: Calibrated numerical model.

Phase 4: Model Simulation & Scenario Analysis

- Run transient-state simulations to assess the system's response to precipitation.
- Compute hydrological balances at the watershed scale.
- Characterize the perched aquifer by estimating their recharge, storage volume, and dynamics.

Deliverable: Results report with interpretation of simulations.

Phase 5: Interpretation, Validation & Final Report (this phase should be completed back at the University)

- Validate the model by comparing results with observed field data.
- Discuss implications for water resource management in the region.
- Write and present the final dissertation.

Deliverable: Final thesis and project presentation.

Expected Outcomes

A validated hydrogeological model of the watershed.

Better understanding of the transient behavior of the perched aquifer.

Recommendations for sustainable groundwater management in San Cristobal.

Tasks of the student/trainee:

Data Collection and Analysis: Analyse hydrogeological data from the selected watershed in San Cristobal, including precipitation records, groundwater discharge, and geological formations from geophysical interpretation. This will help establish baseline conditions for the aquifer's hydrodynamic behavior.

Hydrogeological Model Development: Use numerical modeling software (e.g., METIS, FEFLOW) to create a hydrogeological model of the watershed, incorporating key parameters such as permeability, recharge rates, and aquifer storage properties.

Simulation and Scenario Testing: Conduct steady-state and transient-state simulations to evaluate how the perched aquifer responds to different hydrological scenarios, such as seasonal variations, extreme weather events, and analyze the implications for sustainable water management.

To be able to perform the tasks, the minimum level of language competence expected of the student/trainee in the main working language(s)² that the student/trainee will use at the host institution/organisation is:

The work should be conducted in English. However, the student should have a basic level of Spanish to communicate with the co-workers.

Monitoring and evaluation plan:

During the internship, regular work sessions will be organized between the intern and the internship supervisor in order to complete all tasks.

Commitment of the student and insurance declaration

Personal details

First and last name: Emilio Kenda
Address: Louis-Favre 12
Postcode, City: 2000, Neuchâtel
Country: Switzerland

Insurance policies

The following insurance policies are in force for the whole of my period abroad:

Insurance policy	Name	Policy No.
Health insurance	Iati Seguros de Viaje	560003982
Accident insurance	Iati Seguros de Viaje	560003982
Personal liability insurance	Iati Seguros de Viaje	560003982

It is mandatory to clarify your workplace accident and liability insurance with the host company/organisation, if the project/traineeship is not already covered by your own insurance. It is also compulsory to ensure that health insurance provides sufficient cover in the destination country. In addition, insurance covering repatriation in case of serious accident or illness is strongly recommended.

By signing this document I confirm that I approve the Learning Agreement and will comply with all the arrangements negotiated for my mobility. I will abide by the rules and regulations of the host organisation and communicate with the home institution about any problem or changes regarding the mobility. I commit to what is set out in the SEMP Grant Agreement and I confirm that I have sufficient insurance cover for the period of my mobility abroad.

Data Protection

The undersigned notes that the University of Neuchâtel and the partner university will process his/her personal data and the data generated during the stay abroad for mobility purposes. The undersigned gives his/her consent for the institutions to exchange these data where necessary. In addition, in the framework of the SEMP (Erasmus+), he/she acknowledges that the University of Neuchâtel is required to forward the aforementioned data to the Swiss National Agency Movetia, to ensure proper implementation of the Swiss-European Mobility Programme SEMP. Movetia is mandated by the Swiss government to implement the SEMP.

The student

Date, place: 31.03.2025 , Neuchâtel

Signature:  _____

The student keeps the complete document with all the original signatures; the home and host institutions keep a copy or a scan.

Commitment of the home institution (Université de Neuchâtel)*

The project/traineeship is part of the curriculum: Yes ☒ No ☐

On satisfactory completion of the project/training programme the institution will recognise the project/traineeship as follows: [there should at least be one positive answer]

– Credits (ECTS or equivalence):

Yes ☒ No ☐

If yes: number of ECTS credits or equivalent awarded: The internship will be validated as an integral part of the research project or Master's project, which is equivalent to a total of 30 ECTS.

– record the project/training period in the Diploma Supplement:

Yes ☐ No ☒ - or if not possible,

– record the project/training period in the student's Transcript of Records:

Yes ☐ No ☒

By signing this document, the home Institution confirms that it approves the Learning Agreement and that it will give full recognition to the student for satisfactory completed activities specified in this Learning Agreement; The home institution shall also commit to what is set out in the SEMP Grant Agreement and to the SEMP Quality Principles and /or principles of the Erasmus+ Charter for Higher Education. This includes to prepare students for the practical, professional and cultural life of the host country, in particular through language training tailored to meet their (occupational) needs and to provide logistical support to students concerning travel arrangements, visa, accommodation, residence or work permits and social security cover and insurance. The home institution shall also assist the student in choosing the appropriate host organisation, project/traineeship duration and content to achieve these learning outcomes and to monitor the progress of the project/traineeship and take appropriate action if required.

For the home institution*:

First and last name, function of person responsible for this mobility:

Philippe Renard

Place, date: Paris , 2 Avril 2025

Signature: _____



* In the event that the higher education institution is integrated in a consortium, its commitments may be shared with the coordinating organisation of the consortium.

The host institution/organisation

Paid project/traineeship [The student will receive a salary]: Yes ☐ No ☒

The student/trainee will receive a contribution in kind for his/her project/traineeship: Yes ☐ No ☒

Name and position of the supervisor (if not available, the name shall be communicated to the student/trainee upon his/her arrival):

Marcos Joshua Villacís Erazo, Full-time Associate Professor

Working hours/week for the project/traineeship (overtime should not be the rule):

30 hours

Is the student/trainee covered by the accident insurance of the host organisation (covering at least loss or injury caused to the student in the workplace/institution)?

Yes ☐ (accident insurance No. _____ Insurer: _____)

No ☒

If yes, please specify if it also covers:

- accidents during travel for work purposes: Yes ☐ No ☐
- accidents on the way to work and back from work: Yes ☐ No ☐

Is the student/trainee covered by a liability insurance of the host organisation (covering damage caused by the student/trainee in the workplace/institution)?

Yes ☐ (liability insurance No. _____ Insurer: _____)

No ☒

We confirm that the proposed project/training-programme is approved. On completion of the project/training-programme the institution/organisation will issue a certificate or a confirmation /letter of completion to the student

For the host institution/organisation*:

By signing this document the host institution/organisation confirms that it approves the Learning Agreement and that it will, if required by national legislation, draw up a contract or equivalent document for the project/traineeship in accordance with the requirements of the national legislation. The host institution/organisation will assign to students/trainees tasks and responsibilities (as stipulated in the Learning Agreement) to match their knowledge, skills, competencies and objectives and will ensure that appropriate equipment and support is available. The host institution/organisation will appoint a supervisor who monitors the project/traineeship and provides practical support if required. The student/trainee and host institution/organisation will communicate to the home institution any problem or changes regarding the project/traineeship.

First and last name, function of person responsible for this mobility: Ph.D. Tarquino Sánchez Almeida, Rector

Place, date: Quito , 31.03.2025

Signature: _____

* In the event that the higher education institution is integrated in a consortium, its commitments may be shared with the coordinating organisation of the consortium.