

# Lucas Rivero Iribarne

Utrecht – Netherlands

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## Experience

### Bunge Global SA

Rotterdam, The Netherlands

Data Engineer

2025 – Present

**Desk: Research IT.** Transitioned from Trainee to full-time Data Engineer. I develop ELT pipelines focused on geodata (Sentinel 1 & 2) and global weather data (ERA5, IFS ECMWF).

- Write and maintain Python ELT data pipelines to fetch business-relevant data.
- Dockerize Python pipelines and deploy them to Google Cloud Platform (GCP).
- Model warehouse data (BigQuery and Snowflake) using dbt to populate dashboards.
- Orchestrate and schedule pipelines using Apache Airflow.
- Build geospatial pipelines: Developed a scalable processing pipeline for Sentinel 1 and 2 data in Docker containers on AWS.
- Build processing pipelines to fetch ERA5 data and aggregate it using business-provided geometries.

### Viterra Limited / Bunge Global SA

Rotterdam, The Netherlands

Data Engineer Trainee

2024 – 2025

**Desk: Research IT.** Completed a comprehensive traineeship program focusing on the fundamentals of Data Engineering, including Python, ELT, data modeling, SQL, and cloud computing.

- Applied Agile fundamentals in a team environment.
- utilized Python and Git for version control and software development.
- Developed transformations using Snowflake SQL and dbt.
- Created data visualizations and dashboards in Tableau.

### Viterra Limited

Rotterdam, The Netherlands

Crop Growth Modeling Intern

2024

*Thesis: "From pixels to information: Unveiling the prowess of crop growth models assisted by remote sensing and data assimilation techniques."*

**Desk: Research.**

- Established a Crop Growth Model (CGM) pipeline (Python and Docker) using WOFOST for biomass and yield forecasting of Canola in Canada at the rural municipality level.
- Assimilated MODIS Leaf Area Index (LAI) using the Ensemble Kalman Filter to update the observed crop state.
- Updated and maintained a Postgres/PostGIS database with model inputs (weather, soil, management, regions, remote sensing data) and outputs.
- Calibrated Growing Degree Days (GDD) estimates to account for local cultivars.

### eLEAF

Wageningen, The Netherlands

Cloud Mask Re-labeler, Part-time

2023 – 2024

- Re-labeled cloud mask product outputs using deep learning techniques to re-classify pixels, improving the overall accuracy of the model.

### FONDECYT regular 1212071

Santiago, Chile

GIS Data Analyst

2021 – 2022

*"The catchment memory: understanding how hydrological extremes are modulated by antecedent soil moisture conditions in a warmer climate."*

PI: PhD. Mauricio Zambrano Bigiarini

- Developed a methodology to assimilate LAI data from remote sensing into the Soil Water Assessment Tool (SWAT+) to improve streamflow/evapotranspiration simulations and reduce model equifinality.
- Calibrated the SWAT+ model to simulate water flow and hydrological processes at the catchment level.
- Led, planned, and coordinated field campaigns to retrieve data from rain gauges and soil moisture sensors in four Chilean watersheds.
- Wrote scripts to process field data into actionable information and visualizations.
- Developed web scraping scripts to gather meteorological time series data from national systems.
- Automated the downloading of evapotranspiration (PML) and soil moisture (SMAP and SMOS) products for all of Chile.

### FONDECYT regular 1210932

Santiago, Chile

Research Assistant

2021

*"Improving forest water yield and productivity quantification at the catchment scale by mapping root depth and eco-physiological thresholds with remote sensing and water transfer modeling"*

PI: PhD. MSc. Mauricio Galleguillos Torres

- Wrote scripts to pre- and post-process sap flow data recovered from in-situ sensors.
- Trained a junior research assistant to ensure project continuity.

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**University of Chile**

**Santiago, Chile**

Assistant – PCI CONICYT Chile, NSFC190018

2021

*“Management of global change impacts on hydrological extremes by coupling remote sensing data and an interdisciplinary modelling approach”*

PI: PhD. Mauricio Zambrano Bigiarini

- Planned, coordinated, and led field campaigns to install rain gauges in four Chilean watersheds.
  - Performed rain gauge calibration.
  - Selected optimal installation sites for rain gauges based on project objectives.
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**FONDECYT regular 1171560**

**Santiago, Chile**

Research Assistant

2019 – 2021

*“Assessing spatio-temporal impacts of global change on water and biomass production processes at catchment scale: a synergistic approach based on remote sensing and coupled hydrological models to improve sustainable management of forest ecosystems”*

PI: PhD. MSc. Mauricio Galleguillos Torres

- Led field campaigns to measure ecosystem variables (soil physics, soil moisture, tree cores, sap flow, LAI, biomass, and meteorological data).
  - Estimated biophysical variables (LAI, radiation interception, vegetation cover) from remote sensing data and calibrated against in-situ measurements.
  - Computed Time Integrated NDVI (TIN) fitting curves to describe different ecosystems, including *Acacia caven* shrublands, *Pinus radiata* plantations, and *Nothofagus glauca* native forests.
  - Managed the project database (GIS data, time series, and spreadsheets).
  - Calibrated and installed scientific instrumentation (rain gauges, soil moisture probes, sap flow sensors).
  - Developed scripts to pre-process, post-process, visualize, and analyze retrieved data.
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**Chile Oliva**

**Santiago, Chile**

Intern

2019

*“Olive Oil Yield Prediction Model: Integrating Agronomic and Environmental Variables to Increase Industry Competitiveness and Efficiency.”*

- Measured olive tree yield predictor variables in the field, such as tree height, branch length, fruit count, and tree volume.
  - Wrote R scripts to visualize meteorological data from stations near the studied orchards.
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## Publications

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**2024: Rivero Iribarne, Lucas.** Improving WOFOST biomass and yield simulations: Assimilation leaf area index and canopy nitrogen with the ensemble Kalman filter. [MSc. Thesis]

**2023: Ramirez, E., Galleguillos, M., Seguel, O., Faúndez, C., & Rivero Iribarne, Lucas.** Dissecting the water balance of pine plantations and thorny forest in a Mediterranean landscape. *AGU Fall Meeting 2022, Chicago, IL.*

**2021: Fassnacht, F. E., Poblete-Olivares, J., Rivero, L., Lopatin, J., Ceballos-Comisso, A., & Galleguillos, M.** Using Sentinel-2 and canopy height models to derive a landscape-level biomass map covering multiple vegetation types. *International Journal of Applied Earth Observation and Geoinformation, 94, 102236.*

**2020: Rivero Iribarne, Lucas.** Mapping of crop coefficient (Kc) from remote sensing in avocado in Mediterranean Chile. [Spanish] [BSc. Thesis] *Repositorio Académico - Universidad de Chile.*

## Education

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### Wageningen University and Research (WUR)

Wageningen, Netherlands

Master in Geo-information Science

2022 – 2024

**Thesis:** Improving WOFOST biomass and yield simulations: Assimilation leaf area index and canopy nitrogen with the ensemble Kalman filter.

- **Relevant Courses:** Ecohydrology, Big Data, Geoscripting, Machine Learning, Deep Learning, Advanced Earth Observation.
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### OpenGeoHub

Poznan, Poland

Summer School: Processing and visualizing large geospatial data

Aug 2023

- Attended workshops on spatial data processing in Python and R, raster/vector data cubes, and geoprocessing in GRASS GIS.
  - **Achievement:** 2nd Place in the Hackathon.
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### Centre d'Études Spatiales de la Biosphère (CESBIO)

Online

Summer School (Online)

July 2021

Topic: Remote sensing observations for the monitoring of water and carbon cycles over eco-agro-systems.

- Practical sessions on drought monitoring and evapotranspiration retrieval from space.
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### Pontificia Universidad Católica de Valparaíso

Online

Web Mapping Course

Dec 2020

Spatial analysis and web-mapping introduction with Google Earth Engine (GEE) and R Shiny.

- **R:** Developed an R Shiny app to visualize recycling points in Valparaíso.
  - **GEE:** Performed time series analysis and supervised/unsupervised classifications.
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### Universidad de Chile

Santiago, Chile

Agricultural Engineering

2014 – 2020

**Thesis:** Mapping of crop coefficient (Kc) from remote sensing information in avocado in Mediterranean Chile.

- **Relevant Courses:** Edaphology, Agroclimatology, Soil Physics, Ecosystem Ecology, Remote Sensing, Advanced GIS, Precision Farming.
- **Teaching Assistant:** Irrigation and Drainage; Precision Farming.

## Skills

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**Languages:** Spanish (Native), English (Proficient), French (Slowly getting there)

**Programming:** Python, R, SQL

**GIS & Remote Sensing:** QGIS, ArcGIS, GRASS GIS, Google Earth Engine, SNAP

**Crop Growth Models:** WOFOST, SWAP, SWAT+

**Cloud Computing:** GCP, AWS (Basic)

**Tools & Software:** Docker, dbt, Airflow, HYDRUS 1D, CloudCompare, LaTeX, Excel