

# RES-FOR HIGHLIGHT #6

May 2020

## *RF-LIMS – Use & Structure*

### Overview

The RF-LIMS (<https://rf-lims.wishartlab.com>) is a web-accessible laboratory information management system (LIMS) created to consolidate all of the data from the Resilient Forests<sup>1</sup> (RES-FOR, RF) project, thus making it available for all invited users to view and export long after the project's completion. The RF-LIMS has several measures put in place to ensure data integrity: (1) data is validated before it is imported; (2) edits are logged and can be easily rolled back; and (3) backups are periodically made to recover anything that has been accidentally deleted. This 'Highlight' sheet describes how the data in the RF-LIMS is accessed and stored. Additional in-depth video walkthroughs and tutorials which cover how to navigate the RF-LIMS and how to use its other features are available for download from the "General Files" section accessible from the RF-LIMS' navigation bar.

### Use

To gain initial access to the RF-LIMS, users are invited by email to set up a password which they can use to log in using any internet browser. Anyone with an existing account can invite new users through the "Users" dashboard accessible from the navigation bar's "Admin" dropdown.

The RF-LIMS is primarily used to house the RES-FOR project data. The user interface is particularly well-suited for viewing the data for individual trees, samples, and measurements, each of which can be found by using the filter bar present at the top of their corresponding browse page. All samples and measurements are linked to the RES-FOR coded trees that they were taken from, and these relationships are laid out clearly through the "Tree Summary" navigation on the left-hand side of every entity's page in the RF-LIMS. Samples and measurements are also able to be edited individually through this manner by clicking on the blue "edit" buttons.

For more efficient data upload into the RF-LIMS, there is a "Bulk Import" interface. This feature allows researchers to import all of their data into the RF-LIMS en masse by uploading a single CSV file. Any errors found in the data will stop the import, thus ensuring that researchers make the necessary corrections before they are able to continue. To upload new data types not currently present in the RF-LIMS, a site administrator must first be consulted so that the required headers can be programmed into the system; this allows for data validation upon import, data querying for export, and complete definitions/documentation for all data fields (<https://rf-lims.wishartlab.com/references>).

All of the data in the RF-LIMS can be exported using the "Advanced Search" interface. This feature allows users to select their desired data fields and to narrow down their results by constructing queries for desired conditions. The results can be previewed before being downloaded as a CSV file.

<sup>1</sup> RES-FOR = Resilient Forests: Climate, pests & policy – genomic applications (Genome Canada 2015 LSARP)

# Structure

Experimental data imported into the RF-LIMS (either through the user interface or through the bulk import feature) is saved into the system's database. This import system allows for the relationship among discrete pieces of data to be preserved (e.g. what measurement value belongs to which tree). In the overall structural hierarchy, a single tree can have many samples and each individual sample is associated with a single measurement type. Only the data stored in the database can be exported using the advanced search function. Alternatively, individual files (including papers, presentations etc.) can be uploaded to the "General Files" section where they are downloadable and viewable by all users. With the exception of the files used for bulk imports, the contents of individual files are not validated, nor associated with other entities in the database, and therefore not exportable using the Advanced Search function. Figure 1 summarizes how data in the RF-LIMS is stored, imported, and exported.

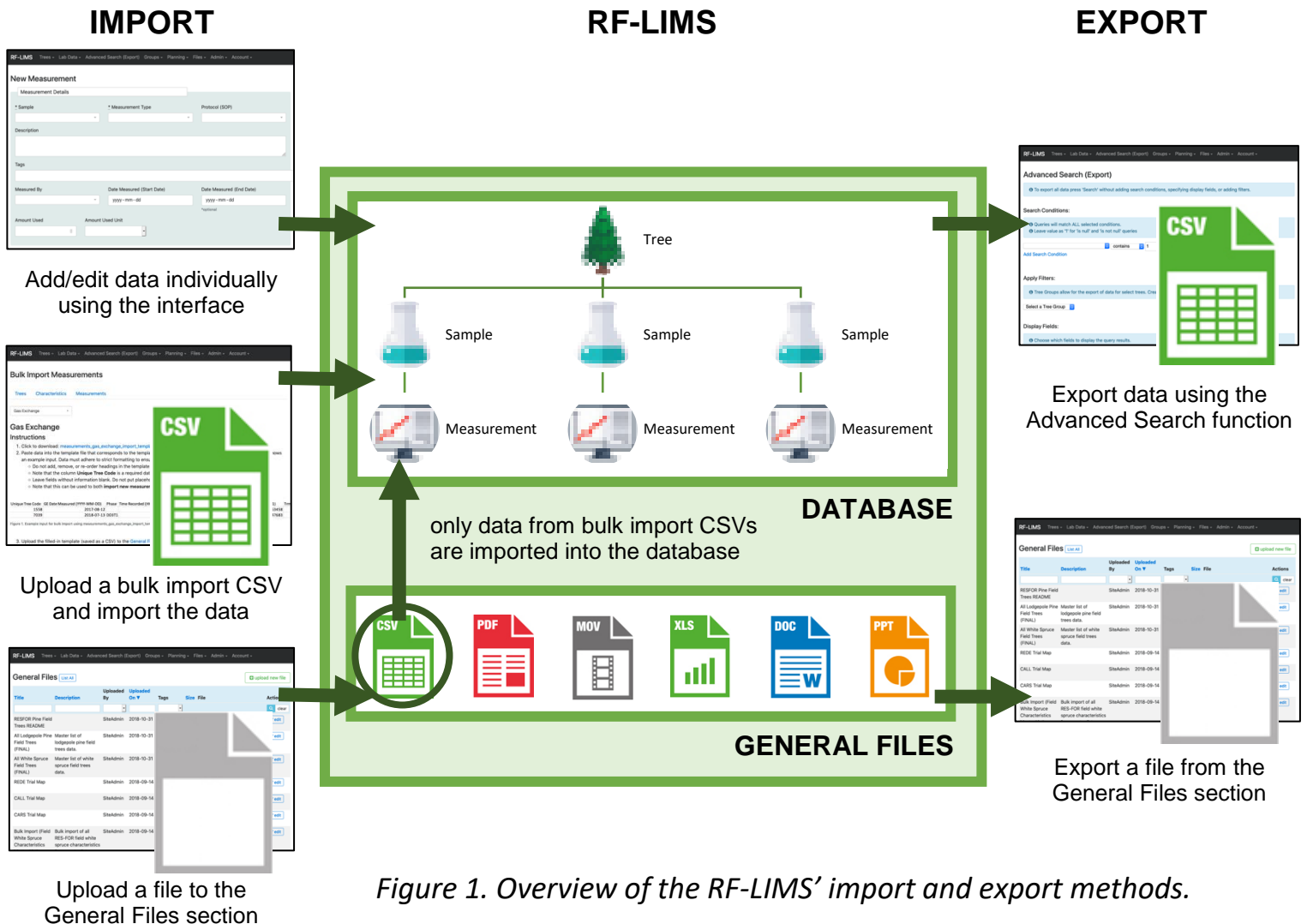


Figure 1. Overview of the RF-LIMS' import and export methods.

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