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**FIA Biosum**

**Bioregional Inventory Originated**

**Simulation Under Management**

**Installation Guide**

**For Version 5.10.0, released on 19 September 2022**

**Introduction**

This guide details the 22 steps required to install the FIA BioSum software on your Windows computer for the first time—what we call a “full installation”. Instructions for upgrading from a previous version of BioSum are provided in an [Appendix](#_Appendix:_How_to) at the end of this guide. **Review of the aforementioned appendix is particularly important for upgrading from a BioSum version earlier than 5.8.9 as BioSum transitioned to 64-bit architecture with the 5.8.9 release**.

BioSum should be installed from an account with administrative privileges. One benefit of installing all components from an “admin” account is that all components are then available to be run from any user account on the computer. It is also essential that BioSum “projects”, the datasets assembled and analyzed during the BioSum workflow, be in “trusted locations” as defined in the MS Access configuration to eliminate disk write failures in a project’s database.

If installing on a Forest Service computer, full administrative account access is not available. The components can be installed using the <Run Elevated> option on the right click menu, paying strict attention to the instructions herein. Users will need to request run-elevated privileges from the FS Customer Help Desk.

The full installation can be initiated from FIA\_BIOSUM\_SETUP.ZIP. Use your favorite archive program (e.g., 7-zip, WinZip) to extract this archive to C:\ -- this will create the folder C:\FIA\_BioSum and subfolders such as C:\FIA\_BioSum\Setup. After archive extraction, three critical installation tasks must be performed:

1. Install R, if not already installed, (version 3.4 or later, available from https://cran.r-project.org/)
2. Install the RODBC package, if not already installed
3. Install FIA Biosum Manager—the analyst-friendly software that manages workflow associated with the many data manipulation and analysis procedures in a BioSum project.

**Software Requirements for Computers Running BioSum**

For BioSum to install and function at all, requirements 1-3 must already be met. Requirement 4 can be met following installation.

1. Microsoft Windows 7 Professional, Enterprise, or Ultimate editions, or Windows 10.
2. Microsoft Office 2016 or greater (through Office 365), which BioSum uses for data storage, but **must be** 64-bit Version and include MS Access. **IMPORTANT: Microsoft Access Database Engine 2016 64-bit Redistributable, a “runtime library” that allows non-Microsoft applications like BioSum to interact with MS Access databases, must also be installed**. This redistributable, ‘accessdatabaseengine\_**X64**.exe’, can be downloaded from https://www.microsoft.com/en-us/download/details.aspx?id=54920, and then installed with admin or Run Elevated (USFS users) privileges.
3. 64-bit SQLite ODBC driver: Forest Service users can install this driver from the Software Center (making sure they are downloading the 64 bit version). All other users should download it from <http://www.ch-werner.de/sqliteodbc/>.
4. A Java SDK (v1.8 or later). BioSum has been tested with both the Oracle SDK and OpenJDK. Forest Service users should install/run the ‘Java Update’ from the Software Center. If a Java SDK has already been installed via procedures consistent with those specified in this guide, there is no need to reinstall this component.

**Setup Overview**

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| Faithfully (and patiently) following these instructions will get you up and running with BioSum soon.   Unless BioSum will be used only to create FVS files for purposes unrelated to BIOSUM analysis, the R software and RODBC driver must also be installed to enable OPCOST to estimate costs of forest operations. Install the FIA BIOSUM MANAGER last.  If RODBC is already installed on your computer, it does not need to be reinstalled. The fia\_biosum\_setup.zip archive file contains all the files needed for a full install (other than the R and FVS Online software which are available separately at <https://cran.r-project.org/> and <https://www.fs.fed.us/fvs/> respectively. It is best to unzip this to the root directory of the C drive (specify C:\ as the location to install—the installed will then create folder named C:\fia\_biosum, with a setup folder, these installation instructions, and release notes). |

**RUN ELEVATED PRIVILEGES OVERVIEW (Forest Service users)**

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| To install or uninstall the software (via the .MSI file) requires administrative privileges. Forest Service users will typically be operating with a Forest Service computer with a standardized “imaged” operating system that does not grant the user admin privileges. For installation steps requiring administrative privileges there are 2 alternatives:   1. Right-click the install file (e.g., the msi) or command (e.g., odbcad32.exe) and select <Install Elevated> or <Run Elevated>, or 2. Shell to a command prompt by selecting locating (in File Explorer) and right-clicking on the file C:\Windows\SysWOW64\cmd.exe, then selecting <Run Elevated>. From the elevated command prompt, navigate to the folder location of the BIOSUM install files and run each of them from the elevated command prompt. This is the PREFERRED and only FULLY TESTED approach.   **<Run Elevated>** is the Forest Service Powerbroker option that should be used for elements of the installation process requiring execution as an admin level user.  Running the BioSum software, once it has been successfully installed, does not require administrative privileges. By default, the BIOSUM software is installed for all user accounts.  If you intend to open and edit BIOSUM MS Access files, make sure that the directory location that houses a BioSum project (which consists of a great many Access database files) of the file is set as a trusted location in the Access software settings (under options, trust center settings).  The best way to make sure that installation components are installed under the admin privileges (non-Forest Service users) is to open a command window as admin and type the commands out in that command window. For example:  When defining the ODBC entries make sure ODBCAD32.EXE is started from the c:\windows\System32 folder, as a user with admin privileges. Note that the System32 folder contains the 64-bit ODBC Data Source Administrator. |

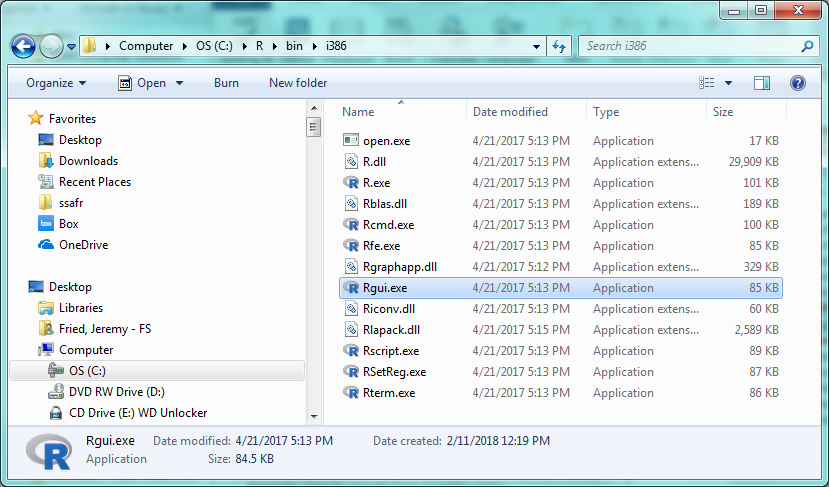
**Setup Instructions**

1. Login to your computer as an administrator
2. **Install R:** If R is already installed then skip to step 12; otherwise, download and install R, with Admin or Run Elevated privileges.

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| 1. Click <OK>. | 1. Click <Next>. |
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| 1. Click <Next>. | 1. By default, R will install in the <Program Files> folder. Click <Browse> to navigate elsewhere, if desired (e.g., C:\R, as shown). |
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| 1. Accept the defaults and click <Next>. | 1. Accept the defaults and click <Next>. |
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| 1. Accept the defaults and click <Next>. | 1. Accept the defaults and click <Next>. |
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| 1. Click <Finish>. | |
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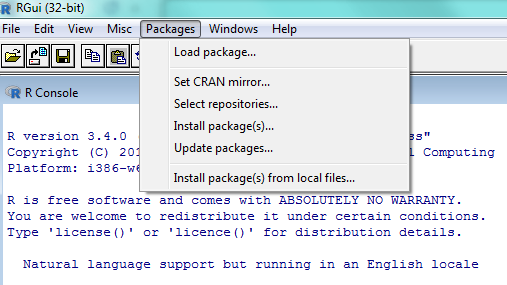
1. **Install RODBC:** If RODBC is already installed then skip to step #17. RODBC enables R to connect to MS Access tables using ODBC. Navigate to the folder containing the R i386 program called RGui.exe and open it. NOTE: An internet connection is required for the RODBC install.



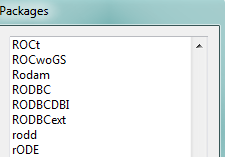
1. Click on <Packages> <Set CRAN mirror>, and choose a mirror location near you.

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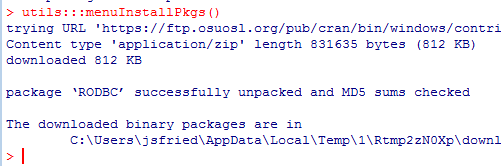
1. Then, click again on <Packages> but this time select <Install Packages>.



1. Select the <RODBC> package to download and install. Click <OK>.



1. Check to see if successfully installed.



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| 1. **Install FIA Biosum Manager:** Navigate to the c:\ fia\_biosum\setup folder. Open the file ‘fia\_biosum\_setup\_versionnumber.msi via right click, Install (install elevated if on a Forest Service computer). Click on <Next>. If Windows displays a message that installation is not allowed, right click on the .MSI file and choose properties; then tic the unblock check box and try the install again. | |
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1. If running Access 2016, Office 365 or any other version later than 2013, you will need to install the **Microsoft Access Database Engine 2016 64-bit Redistributable**. This can be downloaded via https://www.microsoft.com/en-us/download/details.aspx?id=54920, and must be installed with elevated or admin privileges. Forest service users should be able to find this component in the Software Center.

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| Start BioSum Manager and select the Settings menu |
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| 1. Navigate to the directory containing Rscript.exe on your computer. Be sure to select the 64 bit version of Rscript, which is stored in the x64 folder within your R version bin folder. Also navigate to and select the OpCost script file (10\_1\_5.R as of this version of BioSum); it can be found in the C:\Program Files\FIA PNW Portland Forestry Sciences Lab\FIA Biosum 5.9.0\opcost\ folder. Then click <Save> to save these choices, then <OK> to close the Settings window. |
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| 1. Start the BioSum Troubleshooter tool |
| 1. Click the <Calculate Volume and Biomass> button |
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| 1. If numbers show up in the results table, typically after 10 to 20 seconds, all is well with the Java installation. The tool can be closed by clicking the close (x) button in the upper right corner of the dialog. If errors or no results, the Java installation issue needs resolution before BioSum can operate correctly. |
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# Appendix 1: Troubleshooting the Java installation

1. **IMPORTANT**!: Forest service users should run the Java Update from the Software Center to ensure that the Java client on their computer is current. External users need to install Java 1.8 or higher. This is essential for BioSum to calculate volume and biomass of the trees in the inventory sample that are the basis of management simulations.
2. The first time BioSum runs, it copies these 4 files to the %APPDATA% directory:
3. **BioSumComps.jar,**
4. **BiosumSpeciesConfig.db,**
5. **fcs\_tree.db, and**
6. **fcs\_tree\_calc.bat.**
7. To test the functioning of the Java client, open a cmd window and type:

JAVA -jar "%APPDATA%"/FIABiosum/BiosumComps.jar -v

If all is well, you’ll see a response like:

Biosum FICS Client version 0.3.04

1. If all is not well, check to make sure that the 4 files mentioned in step 2 are in the %APPDATA% directory. To verify the location of the %APPDATA% directory, start BioSum and click on the ‘Settings’ menu item at the top of the BioSum to review the path to the BioSum settings folder. If any of these files are missing, they can be copied from C:\Program Files\FIA PNW Portland Forestry Sciences Lab\FIA Biosum 5.9.0\fcs (after installing the BioSum 5.9.0 msi). Once these files are in place, return to step 3 again.
2. If all is still not well, there may be a problem with your Java installation. Open a cmd window and type:

JAVA – version

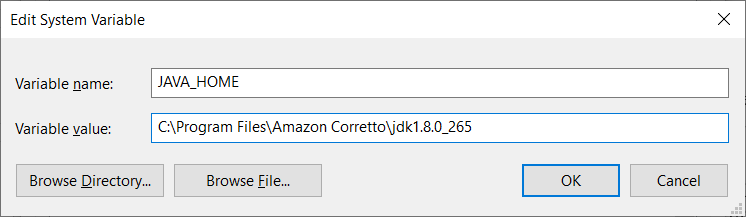
If all is well, you’ll see a response like:

openjdk version "1.8.0\_265"

OpenJDK Runtime Environment Corretto-8.265.01.1 (build 1.8.0\_265-b01)

OpenJDK 64-Bit Server VM Corretto-8.265.01.1 (build 25.265-b01, mixed mode)

1. If all is still not well, try reinstalling Java. Note that the computer should be restarted after reinstalling Java so that the environment variables can be updated. Return again to step 3 to see if the problem is resolved.
2. If you believe your Java installation is good, but BioSum is still having trouble running the Tree Troubleshooter, try setting your JAVA\_HOME environment variable to your Java bin directory:
   * Run a command prompt (CMD.EXE) with admin access
   * Type sysdm.cpl <Enter>
   * Click the <Advanced> tab
   * Click the button <Environment Variables>
   * Find or create the JAVA\_HOME variable in the bottom ‘System’ list
   * See an example of a JAVA\_HOME entry below



Restart your computer after saving the JAVA\_HOME variable and try running the Tree Troubleshooter again. The test from step 3 does not recognize the JAVA\_HOME variable.

1. If multiple users share a computer, this troubleshooting may need to be completed by each user.

# Appendix 2: Installing FIA BioSum on a Virtual Machine (VM)

While BioSum has been run by some users on virtual machines, we don’t recommend this approach, and do not commit to supporting it, as it increase the complexity of the software environment and can make it more difficult to troubleshoot issues that arise (the developers do not have virtual environments to test in and the BioSum development project does not have the resources to fully support users who attempt this).

In our attempts to support those who despite these challenges attempt to run BioSum in a virtual machine (e.g., on a Mac), here are some helpful tips:

1. Make sure Java runtime 8 or later is installed. See Appendix 1 for troubleshooting a Java installation.
2. Simplify your ODBC environment by installing ONLY the 64-bit SQLite driver
3. File permissions can be an issue when BioSum tries to connect to existing SQLite databases because Windows has one way of managing these and your VM may have another. It is best practice to install BioSum as the same user who will be using the program, NOT as admin. Also, the Access DB engine and SQLite driver may need to be installed by the same user who will be using BioSum.