

How to Create an ODBC Connection and Setup SoilDB for Use with R

This job aid contains excerpts from the most current documentation for soilDB, which is available at https://r-forge.r-project.org/scm/viewvc.php/*checkout*/docs/soilDB/soilDB-Intro.html?root=agp.

1. Set Up an ODBC Connection to the Local NASIS Database

Objective

Set up an ODBC (Open Database Connectivity) link between a local NASIS database and R so that pedon data records can be queried with the [soilDB](#) package.

Procedure

In Windows 7.0, choose “Start.” Type “ODBC” in the box named “Search Programs and Files.”

Choose “Data Sources (ODBC).” This opens up a window titled “ODBC Data Source Administrator.”

From the “User DSN” tab, click the “Add...” button.

Select the “SQL Server Native Client 10.0” driver.

Name the data source “nasis_local.” Press “Finish.”

A window titled “Create a New Data Source to SQL Server” opens.

Enter this name: nasis_local

Provide this description: Local_NASIS_connection

Provide a sever name in this form: XXXXXX\NASISSQLEXPRESS

where “XXXXXX” is the full name of your local machine. For example: USNE0LINC9L140\NASISSQLEXPRESS.

The full name of your local machine is typically labeled on the outside of your computer. It can also be accessed by right-clicking on the “My Computer” icon (which should be on your desktop) and then clicking on the “Properties” tab. The

name will look something like: CASONORA00L354. The name can also be obtained by double clicking on the TSD icon.

When finished, click “Next.”

You will be asked “How should SQL Server verify the authenticity of the login ID?” Choose the second option: “With SQL Server authentication...” Use the following login and case-sensitive password:

login: NASISSQLRO

password: nasisRe@d0n1y

Note that in the password, 0 and 1 are numbers, not letters. The “0” is a zero, and the “1” is a one.

Choose “Next.”

On the next screen, you must check the box next to “Change the default database to:” and select “Nasis-local” as the default database from the dropdown list. Do not change any of the other default values.

Click “Next” and then “Finish” to finalize the connection.

If you click on the “Test Data Source” button, the result should be “Tests Completed Successfully!”

Once the ODBC connection is set up, it will allow you to interface between the NASIS local database and ArcGIS, R, or ACCESS databases, such as Pedon PC or Analysis PC.

2. Load Pedon Data into R from an ODBC Database Connection

Objective

Load pedon data into R from an ODBC database connection to the local NASIS database and from a Microsoft ACCESS pedon.accdb database.

Introduction

The soilDB module/package is written in R and provides methods for extracting soils information from a specific Microsoft ACCESS database format (Pedon.accdb), local NASIS databases (MS SQL Server), or the Soil Data

Access (SDA) Web service. The data is placed into temporary tables for viewing and analyzing using R.

Installation

SoilDB depends on the user downloading the most current packages onto the local computer.

To load the packages:

Start RStudio by typing “RStudio” in the “Search programs and files” box. If RStudio has never been run before, choose “All Programs” from the start menu and then browse for and choose “RStudio” in the “RStudio” folder.

Load the most current version of soilDB by typing (or copying and pasting) the following at the “>” prompt:

```
install.packages('soilDB', dep=TRUE)
```

You will be prompted to choose a CRAN mirror.

Choose “USA (CA 2).” The download process will begin.

After the soilDB package is complete, load SSOAP and XMLSchema packages by typing (or copying and pasting) the following command after the “>” prompt.

```
install.packages("SSOAP", repos = "http://www.omegahat.org/R",  
type="source")
```

About the ODBC Connection to the Local NASIS Database

Functions in soilDB can only access local NASIS data if the data has been loaded into your “selected set.” Although it is possible to filter pedon records or DMU records within R, it is often simpler to modify the “selected set” in NASIS.

1. Download pedons associated with your office, project, or MLRA from the National NASIS database to your local database.
2. Query the local NASIS database to build your selected set (pedon, site, transect, etc.).
3. Load data from the NASIS selected set into R for further filtering/processing.

Loading Data Using High-Level Functions

When loading pedons with the “fetchNASIS()” or “fetchPedonPC()” functions, checks are performed for:

1. Inconsistent horizon boundaries; pedons with inconsistent horizon boundaries are not loaded
2. Missing lower horizon depths; bottom depth is populated with the top depth of the same horizon
3. Sites missing pedon records; sites missing pedon records are not loaded

Fetch Pedons or DMU Data from Local NASIS Database

The “fetchNASIS()” function will load all pedons and data map units from the NASIS selected set. An ODBC connection named “nasis_local” must be established first, [as described previously](#).

Type the command “library(soilDB)” after the “>” prompt.

```
library(soilDB)
```

Then run the “fetchNASIS()” command to load pedons from local NASIS database. At the prompt, type “f <- fetchNASIS()”

```
f <- fetchNASIS()
```

Fetch Pedons from PedonPC 5.x Database

The “fetchPedonPC(dsn)” function will load all pedon records into the current R session, based on the value of dsn, which is a path to a PedonPC version 5.x database.

The ODBC connection to an Access database only functions using a 32-bit version of R. The fetchPedonPC(dsn) command, therefore, only functions using a 32-bit version of R. If RStudio is using the 64-bit version of R, the user must follow these steps: Choose “Options” from the tools dropdown menu, select the “Change...” button next to the R Version, and select the radio button “Use your machine’s default version of R (32-bit).” The user then selects “OK” and is prompted to quit and re-open RStudio.

Again, type the command “library(soilDB)” after the “>” prompt.

```
library(soilDB)
```

Identify the location of the pedon.accdb file and provide it after the “>” prompt:

```
dsn <- "S:/Service_Center/NRCS/pedon/pedon.accdb"
```

You can then run the fetch Pedon PC command.

```
f <- fetchPedonPC(dsn)
```

At this point, the data has been transferred into R tables from either the local NASIS selected set or Pedon PC. The data is ready for viewing and analysis. Additional documentation is available at https://r-forge.r-project.org/scm/viewvc.php/*checkout*/docs/soilDB/soilDB-Intro.html?root=aqp.