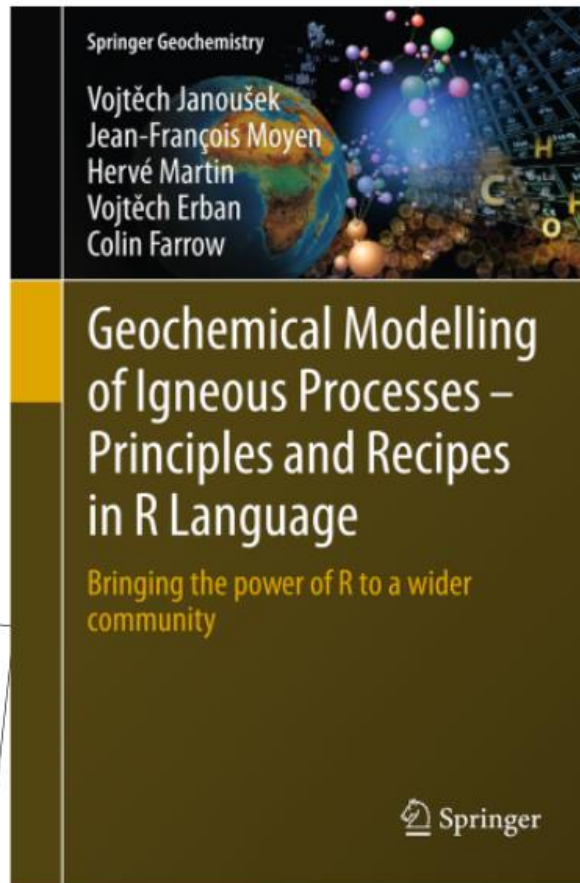
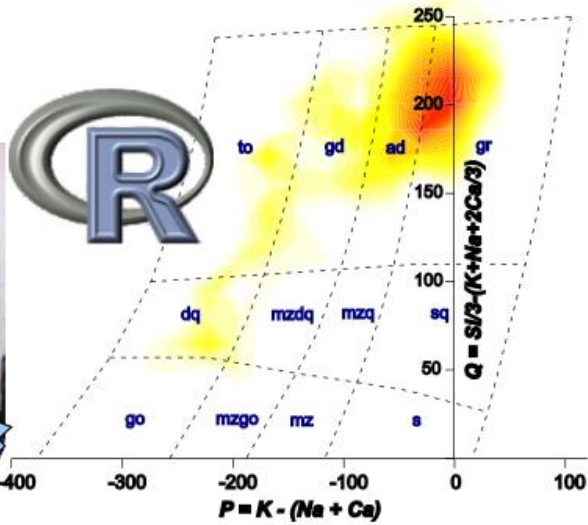
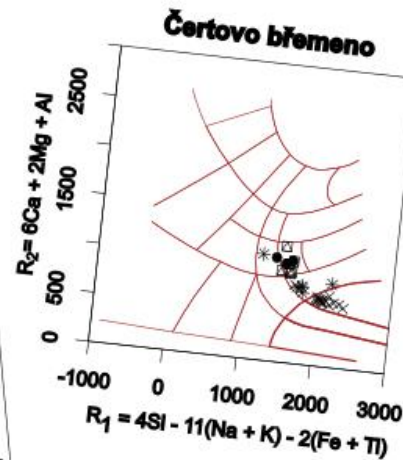
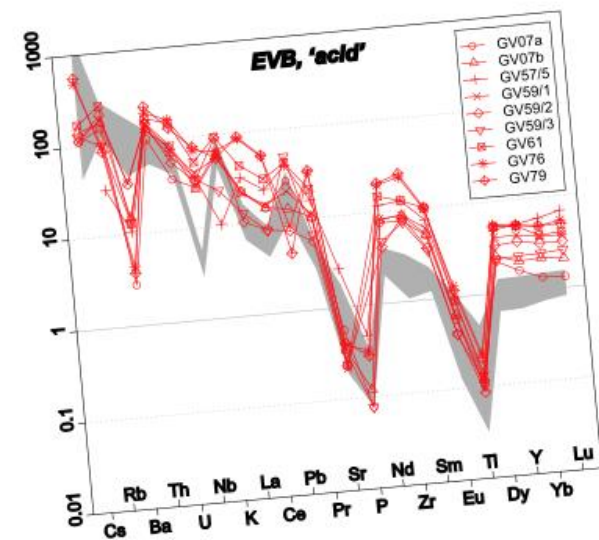




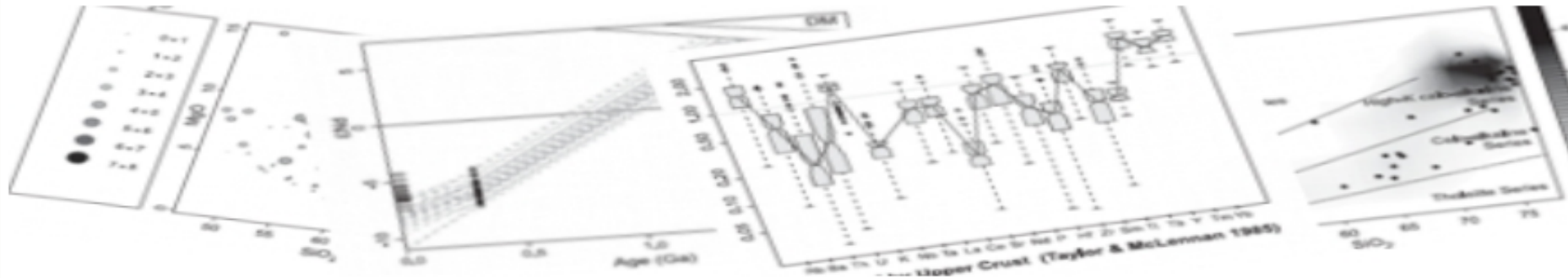
GCDkit

<http://www.gcdkit.org/>



<http://www.gcdkit.org>

Janoušek, V., Farrow, C. M. & Erban, V. 2006. Interpretation of whole-rock geochemical data in igneous geochemistry: introducing Geochemical Data Toolkit (GCDkit). *Journal of Petrology* 47(6):1255-1259



[Home](#) | [Download](#) | [Documentation](#) | [News](#) | [Plugins](#) | [GCDkit publications](#) | [Citing publications](#) | [Team](#) | [Links](#) |

<http://www.gcdkit.org/download>

GCDkit versions available

Version	Release date	GCDkit Win Installer	R Installer	Patch	Library (advanced users)	Changes
6.1	July 8, 2022	GCDkit_6.1_for_R4.1.3.zip	R 4.1.3		GCDkit_6.1.zip GCDkit_6.1.tar.gz	pdf
Legacy versions (download & run instructions)						
6.0	Aug. 16, 2019	GCDkit6.0_for_R3.6.0.zip	R 3.6.0		GCDkit_6.0.zip GCDkit_6.0.tar.gz	pdf
5.0	Mar. 28, 2018	GCDkit5.0_for_R3.4.3.zip	R 3.4.3		GCDkit_5.0.zip GCDkit_5.0.tar.gz	pdf
4.1	Feb. 10, 2016	GCDkit4.1_for_R3.2.1.exe	R 3.2.1		GCDkit_4.1.zip	pdf
4.00	Nov. 15, 2015	GCDkit4.00_for_R3.2.1.exe	R 3.2.1		GCDkit_4.00.zip	pdf
3.00	May 11, 2013	GCDkit3.00_for_R2.13.2.exe	R 2.13.2	patch		
2.3	May 11, 2008	GCDkit2.3_for_R2.7.0.exe	R 2.7.0			pdf

Download:

[GCDkit 6.1 \(July 8, 2022\)](#)
[R 4.1.3 \(mirrors\)](#)

Documentation:

[Introductory text](#)
[List of diagrams](#)
[Complete Documentation](#)
[GCDkit cheat-sheet](#)

[R documentation](#)

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[Read our blog](#)

1. télécharger R et GCDkit
2. installer R
3. Décompresser le dossier d'installation de GCDkit

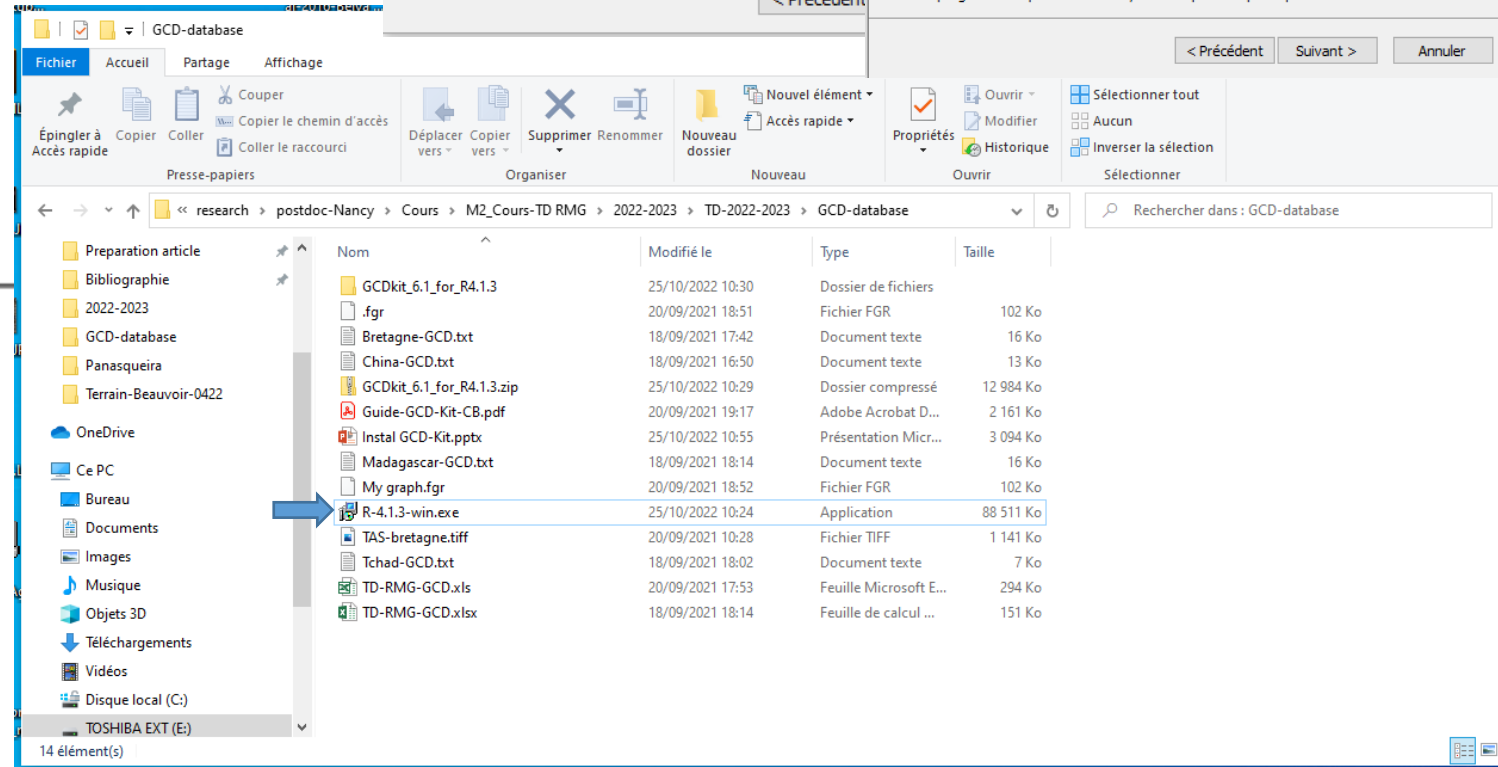
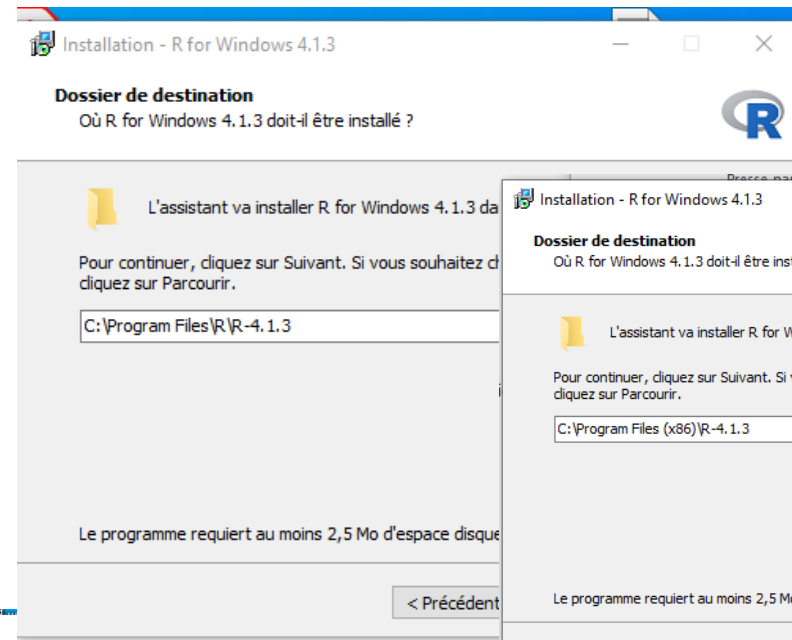
1. télécharger R et GCDkit
2. installer R
3. Décompresser le dossier d'installation de GCDkit

GCDkit

Index of /bin/windows/base/old/4.1.3

Name	Last modified	Size
Parent Directory		-
md5sum.txt.R-4.1.3	2022-03-10 09:32	50
NEWS.R-4.1.3.html	2022-03-10 08:16	109K
R-4.1.3-win.exe	2022-03-10 09:32	86M
README.R-4.1.3	2022-03-10 08:16	8.5K
release.html	2022-03-10 08:16	90
rw-FAQ.html	2022-03-10 08:16	88K
SVN-REVISION.R-4.1.3	2022-03-10 08:16	46

Apache/2.4.39 (Unix) Server at cloud.r-project.org Port 80



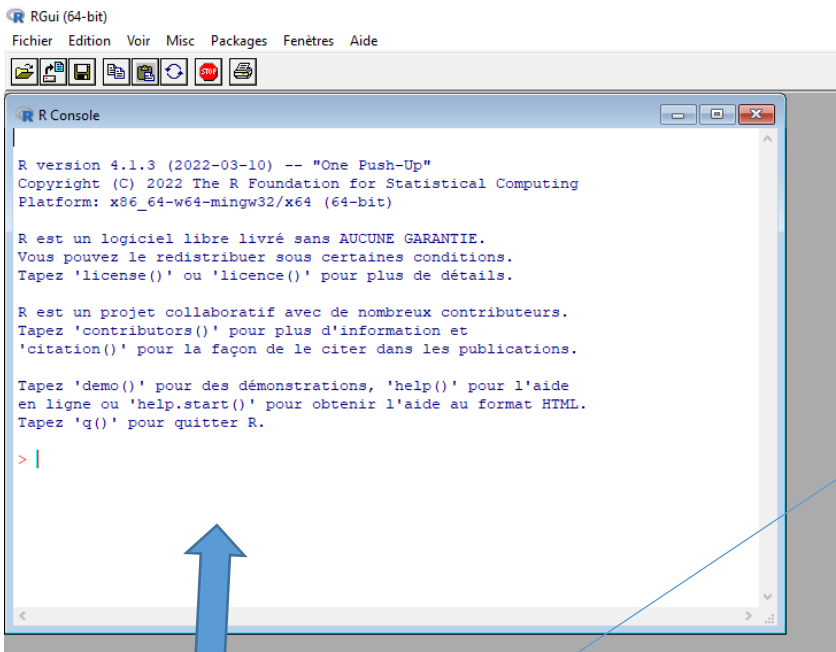
4. Lancer R



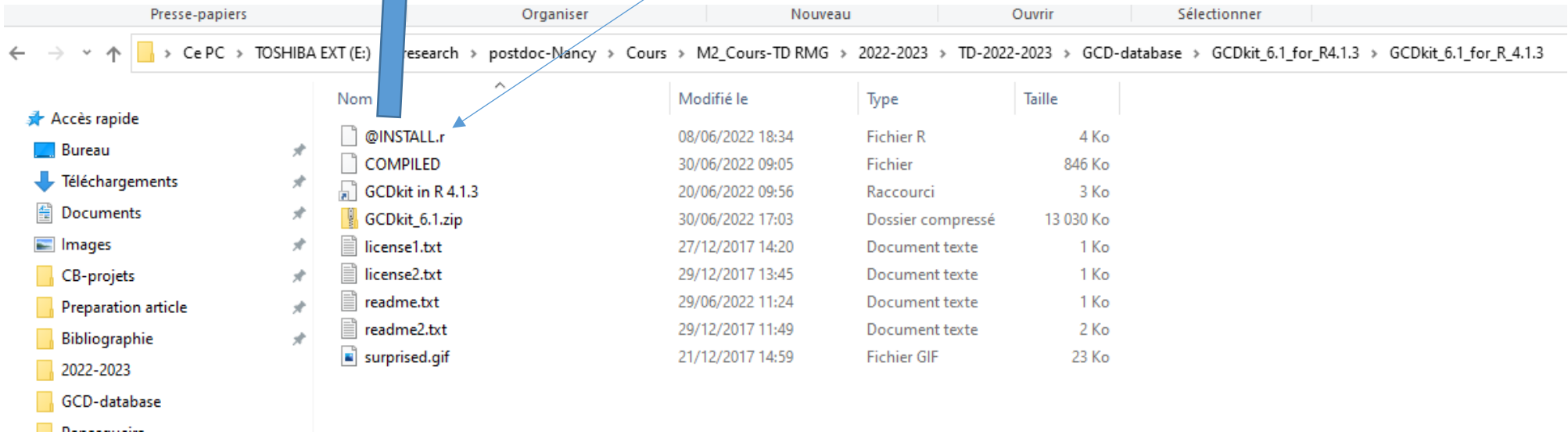
32 bit



64 bit



5. Glisser la routine d'installation de GCDkit dans la console R. Préférer la version 32 bit (i386) à 64 bit (permet de charger directement des fichier xls)





```
R version 4.1.3 (2022-03-10) -- "One Push-Up"
Copyright (C) 2022 The R Foundation for Statistical Computing
Platform: x86_64-w64-mingw32/x64 (64-bit)

R est un logiciel libre livré sans AUCUNE GARANTIE.
Vous pouvez le redistribuer sous certaines conditions.
Tapez 'license()' ou 'licence()' pour plus de détails.

R est un projet collaboratif avec de nombreux contributeurs.
Tapez 'contributors()' pour plus d'information et
'citation()' pour la façon de le citer dans les publications.

Tapez 'demo()' pour des démonstrations, 'help()' pour l'aide
en ligne ou 'help.start()' pour obtenir l'aide au format HTML.
Tapez 'q()' pour quitter R.

> source("E:\\research\\postdoc-Nancy\\Cours\\M2_Cours-TD RMG\\2022-2023\\TD-20$
Le chargement a nécessité le package : tcltk
Le chargement a nécessité le package : compiler
Installing GCDkit, version: 6.1 (Invincible tractor)
x86_64-w64-mingw32 4.1.3
Windows 10 x64 (build 19044)
```



GCDkit is a system for handling and recalculation of whole-rock major- and trace-element analyses and radiogenic isotope data from igneous rocks. It is fully menu driven but, at the same time, can be used in an interactive regime (power users only).

Note that recommended systems to run GCDkit are Windows 11/10/8/7. The current version should also work on Mac OS X (release 10.6 and above) and various distributions of Linux (Debian, RedHat, SUSE, Ubuntu).

Using this system, the data can be loaded, individual analyses grouped into coherent groups or searched according to various criteria. They can be plotted into commonly used classification diagrams (e.g. Harker plots, TAS, AFM, R1-R2) as well as a variety of user-defined plots (binary and ternary plots, multiple plots, spider diagrams).

Moreover, some basic statistical methods are implemented (both for the whole data set and individual groups) using a fraction of the power built in R. Included are the descriptive statistics, boxplots, histograms, principal component and cluster analysis. GCDkit also makes possible the most common normative calculations to be performed.

Functions for interpreting radiogenic (Sr-Nd) isotopic compositions have been also included (calculating Sr and Nd initial compositions, Nd model ages etc.).

The long-term aim is to build a single, coherent and eventually platform-independent system with high-level plotting capabilities for interpretation of whole-rock geochemical data, that would be straightforward to use by ordinary users but, at the same time, easily expandable by the more demanding ones.

Next

Cancel

6. Installer GCDKit.



R Console

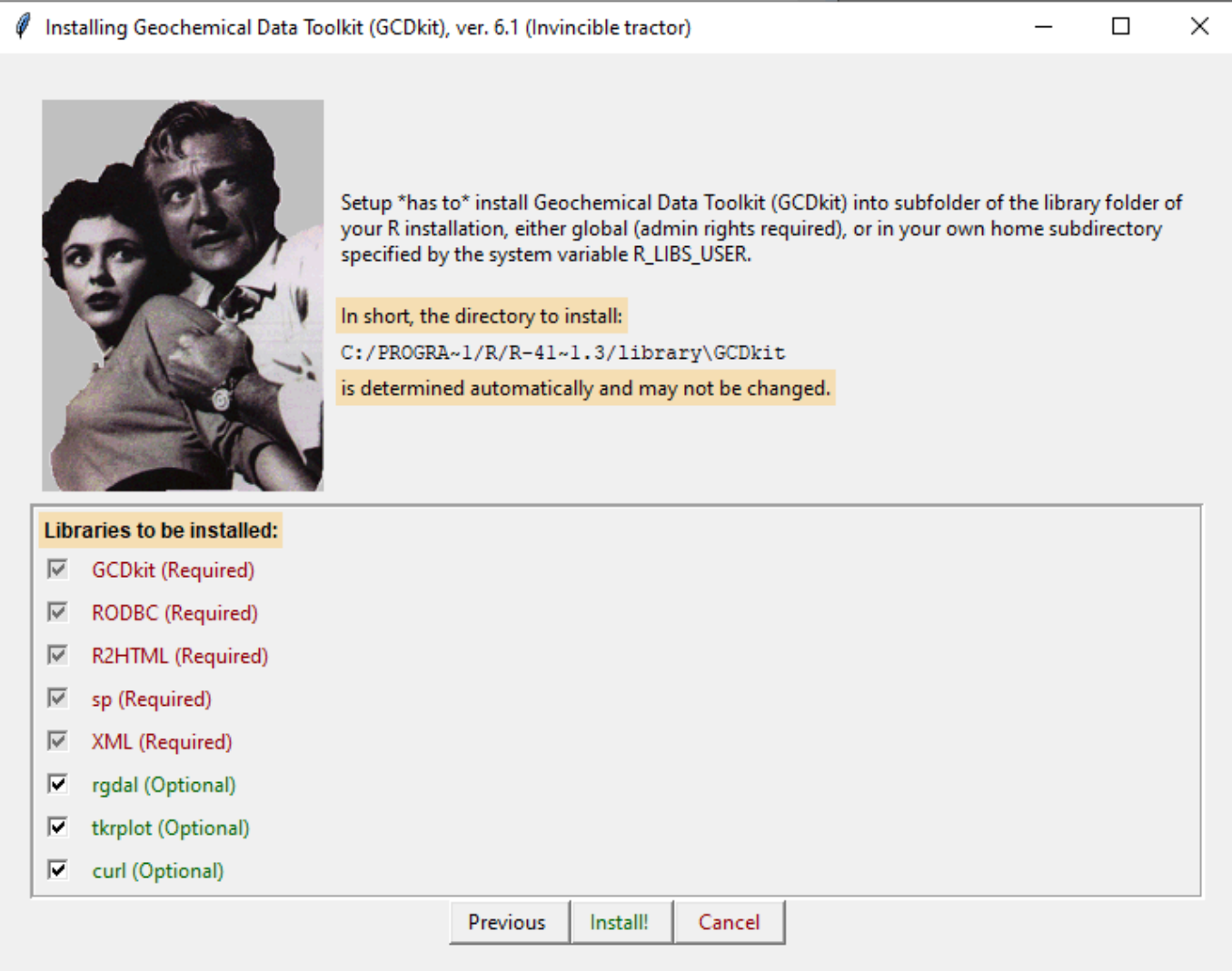
```
R version 4.1.3 (2022-03-10) -- "One Push-Up"  
Copyright (C) 2022 The R Foundation for Statistical Computing  
Platform: x86_64-w64-mingw32/x64 (64-bit)
```

```
R est un logiciel libre  
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Tapez 'license()' ou '
```

```
R est un projet collaboratif  
Tapez 'contributors()' ou  
'citation()' pour la f
```

```
Tapez 'demo()' pour de  
en ligne ou 'help.start'  
Tapez 'q()' pour quitt
```

```
> source("E:\\research\\  
Le chargement a nécess  
Le chargement a nécess  
Installing GCDkit, ver  
x86_64-w64-mingw32 4.1  
Windows 10 x64 (build
```



6. Installer GCDKit.



```
R Console

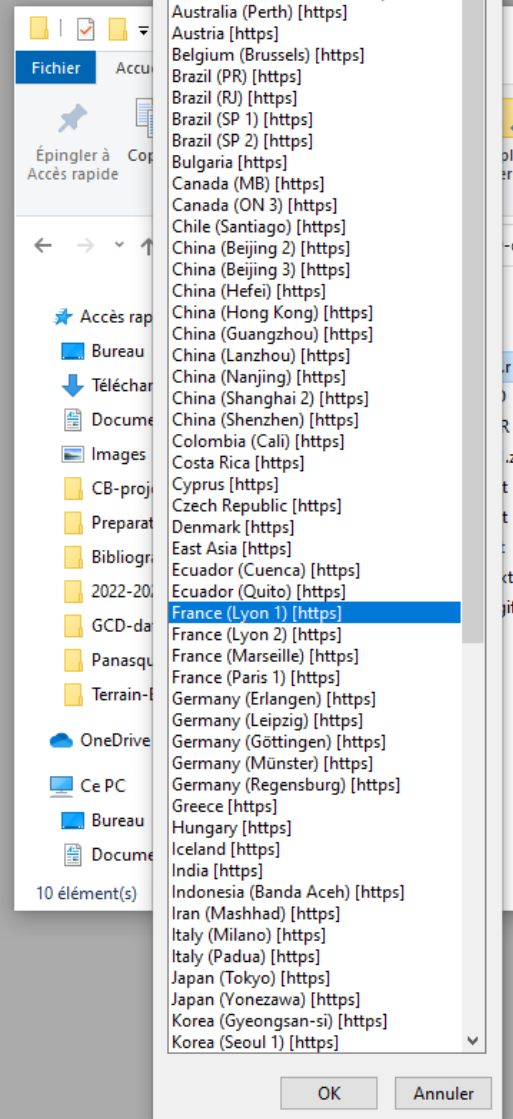
Copyright (C) 2022 The R Foundation for Statistical Computing
Platform: i386-w64-mingw32/i386 (32-bit)

R est un logiciel libre livré sans AUCUNE GARANTIE.
Vous pouvez le redistribuer sous certaines conditions.
Tapez 'license()' ou 'licence()' pour plus de détails.

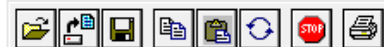
R est un projet collaboratif avec de nombreux contributeurs.
Tapez 'contributors()' pour plus d'information et
'citation()' pour la façon de le citer dans les publications.

Tapez 'demo()' pour des démonstrations, 'help()' pour l'aide
en ligne ou 'help.start()' pour obtenir l'aide au format HTML.
Tapez 'q()' pour quitter R.

> source("E:\\research\\postdoc-Nancy\\Cours\\M2_Cours-TD RMG\\2022-2023\\TD-20$
Le chargement a nécessité le package : tcltk
Le chargement a nécessité le package : compiler
Installing GCDkit, version: 6.1 (Invincible tractor)
i386-w64-mingw32 4.1.3
Windows 10 x64 (build 19044)
Installation des packages dans 'C:/Users/Ballouarl/Documents/R/win-library/4.1'
(car 'lib' n'est pas spécifié)
--- SVP sélectionnez un miroir CRAN pour cette session ---
```



6. Installer GCDKit.



The downloaded binary packages are in

Instal
(car
packag

Librar
Patchi
Enteri
Window
R vers

Geoche
built

Please
using

=====
Vojtec
Interp
introc
Journa

doi: 10.1093/petrology/eg1013

Ready 2 Go - Enjoy!

Environmental variable GCDKIT_HOME set.

Environmental variable GCDKIT_RHOME set.

Copying the shortcut icon GCDkit in R 4.1.3.lnk to the Desktop folder: C:\Users\Ballouar1\Desktop

GCDkit options

GUI ☐ win ☒ tcltk Working directory ... C:/Program Files/R/R-4.1.3/GCDKit

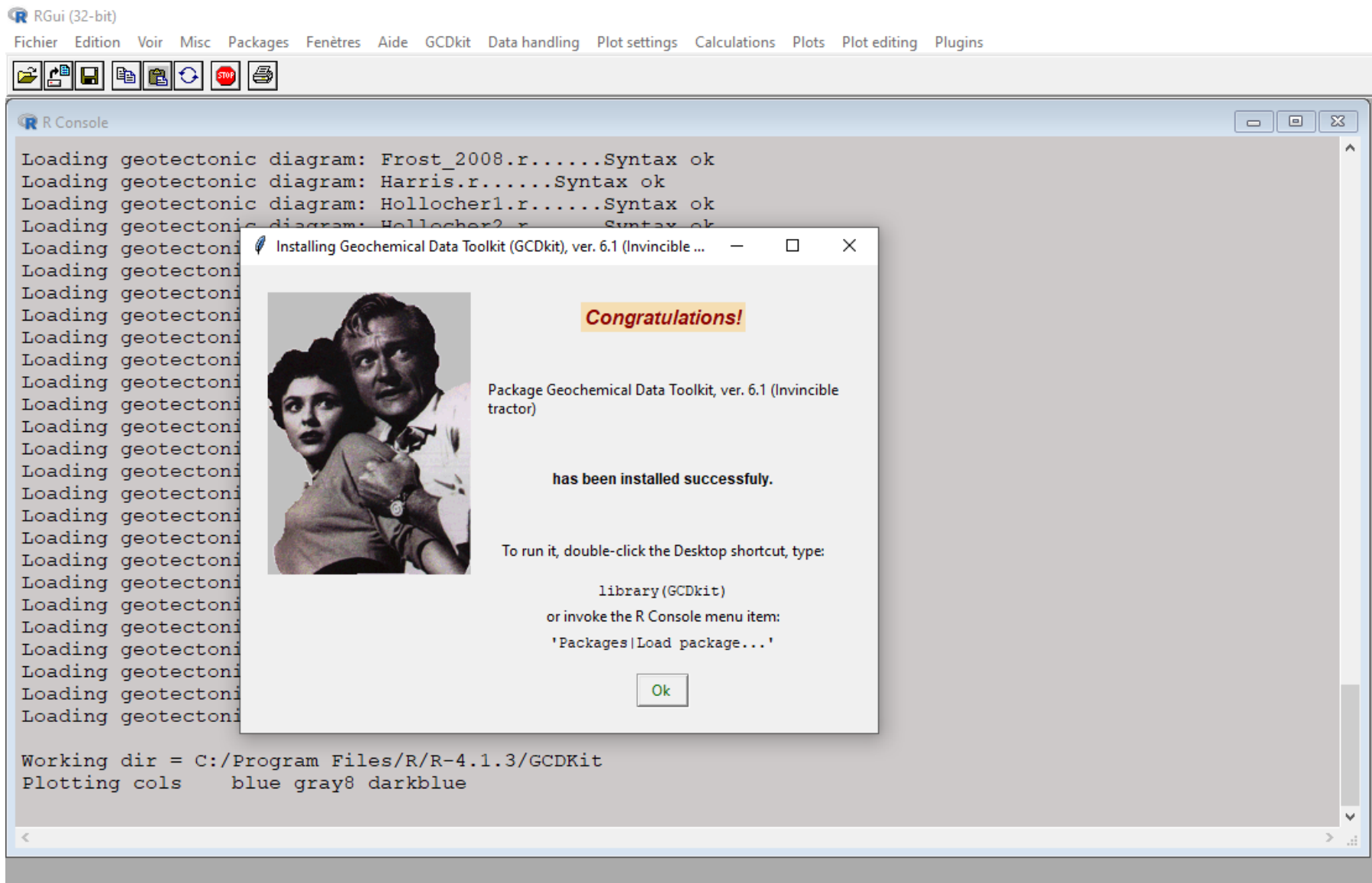
Minimize output on screen ☐ Precision of results 3 Plotting symbols magnification 1

Annotate fields in discrimination plots? ☒ Yes ☐ No Language Czech English

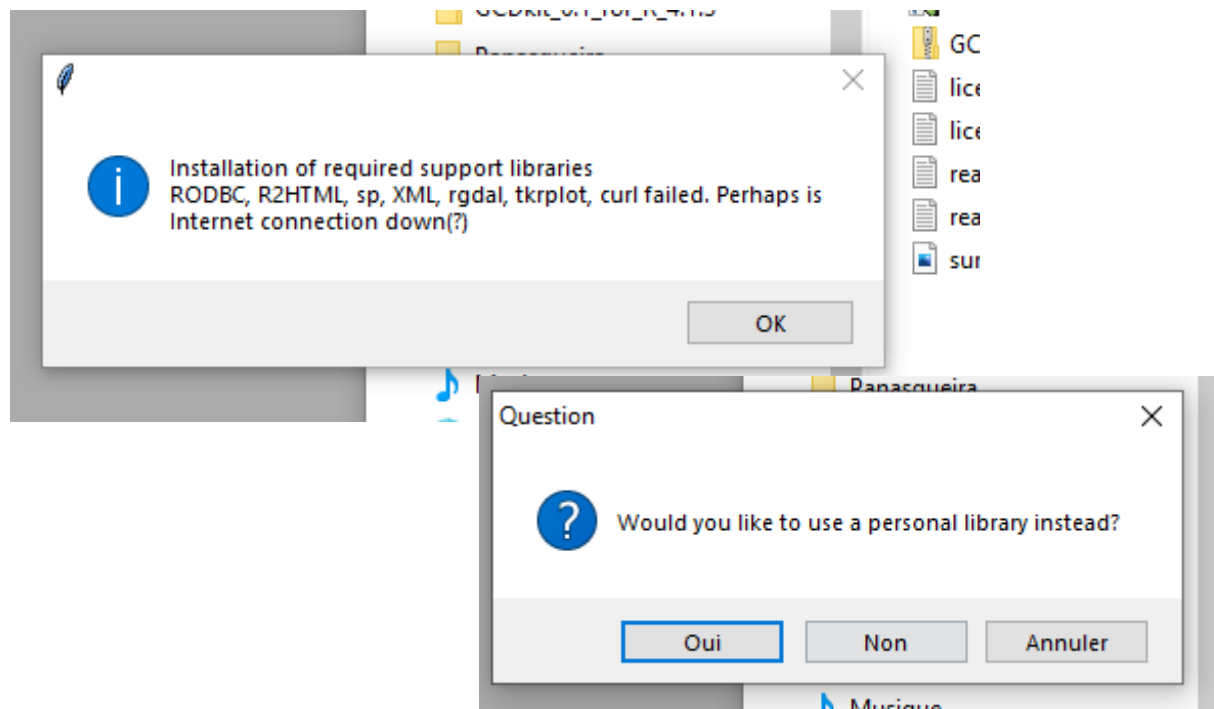
Colours for boundaries/labs blue gray8 Colours for extra texts blue gray8 Set to BW ☐

Ok/Save Cancel Restore defaults Help

6. Installer GCDKit. Essayer en 32 bit (i386) si la version 64bit ne fonctionne pas



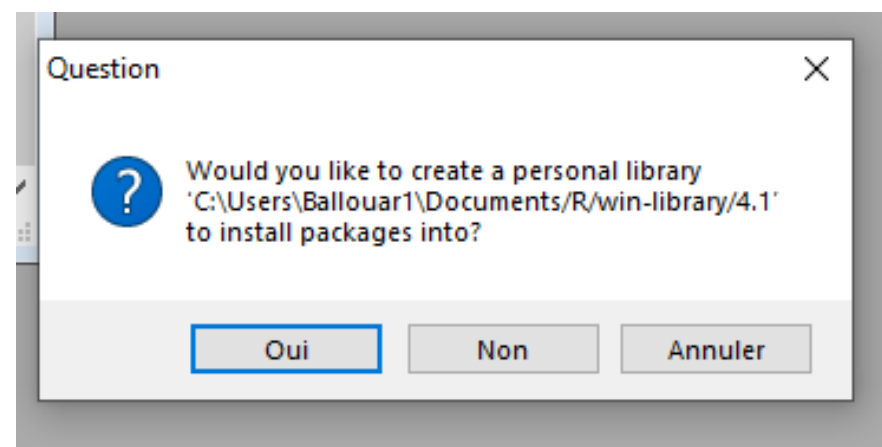
6. Installer GCDKit. Essayer en 32 bit (i386) si la version 64bit ne fonctionne pas



6. Installer GCDKit.

Possibles messages d'erreur.

Dire oui à tous ces messages plus relancer l'installation de GCD Kit (cf retour diapo 4)





R Console

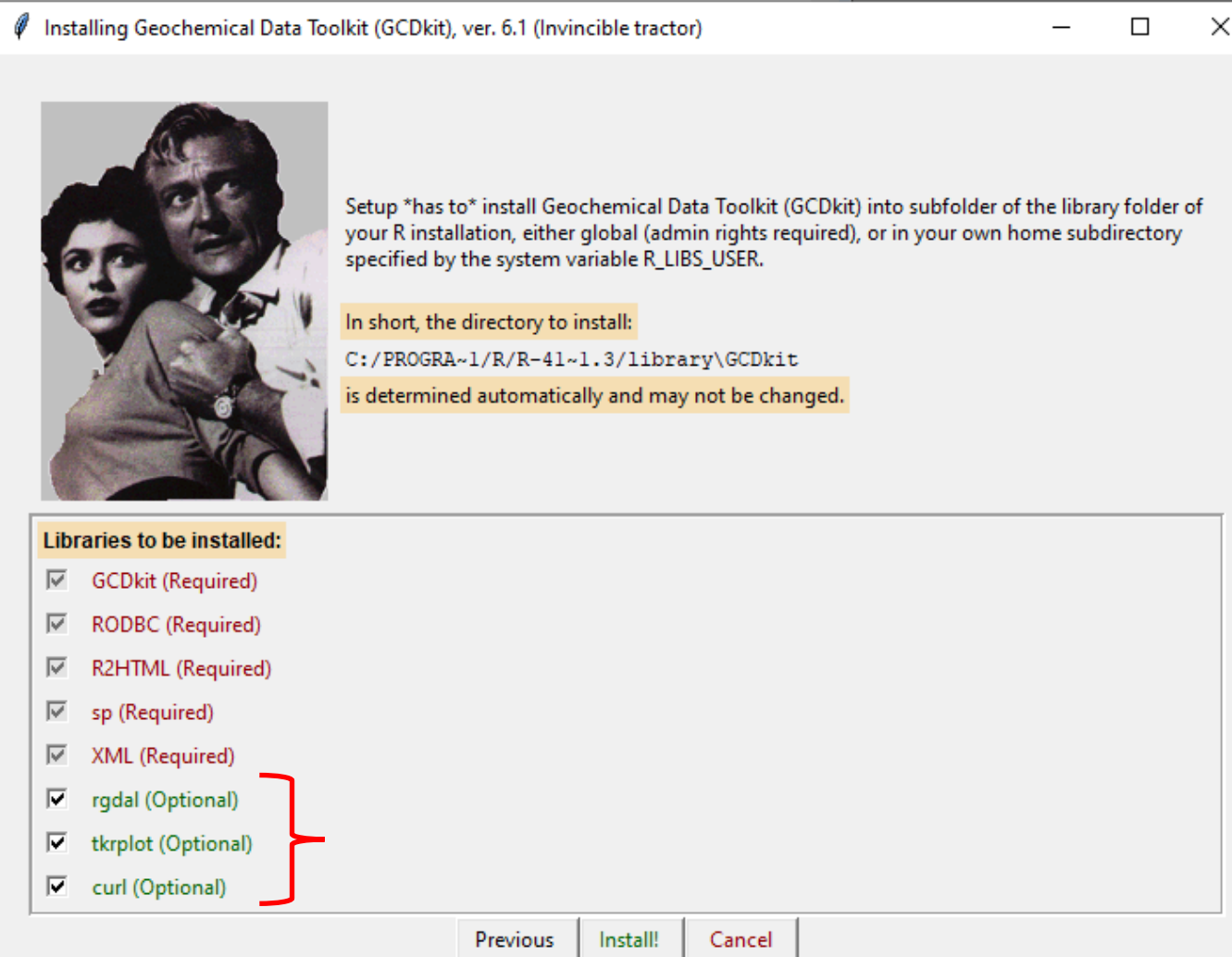
```
R version 4.1.3 (2022-03-10) -- "One Push-Up"  
Copyright (C) 2022 The R Foundation for Statistical Computing  
Platform: x86_64-w64-mingw32/x64 (64-bit)
```

```
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Tapez 'license()' ou 'licence()'
```

```
R est un projet collaboratif  
Tapez 'contributors()' pour la liste des contributeurs  
'citation()' pour obtenir la citation
```

```
Tapez 'demo()' pour voir un exemple en ligne ou 'help.start'  
Tapez 'q()' pour quitter
```

```
> source("E:\\research\\install_gcdkit.R")  
Le chargement a nécessité le package: R6  
Le chargement a nécessité le package: Rcpp  
Installing GCDkit, ver. 6.1  
x86_64-w64-mingw32 4.1.3  
Windows 10 x64 (build 19H2)
```



6. Installer GCDKit.

Si ca ne marche toujours pas:

Décocher les options vertes



RGui (32-bit)

Fichier Edition Voir Misc Packages Fenêtres Aide

R Console

```
R version 4.1.3 (2022-03-10) -- "One Push-Up"
Copyright (C) 2022 The R Foundation for Statistical Computing
Platform: i386-w64-mingw32/i386 (32-bit)

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R est un projet collaboratif avec de nombreux contributeurs.
Tapez 'contributors()' pour plus d'information et
'citation()' pour la façon de le citer dans les publications.

Tapez 'demo()' pour des démonstrations, 'help()' pour l'aide
en ligne ou 'help.start()' pour obtenir l'aide au format HTML.
Tapez 'q()' pour quitter R.

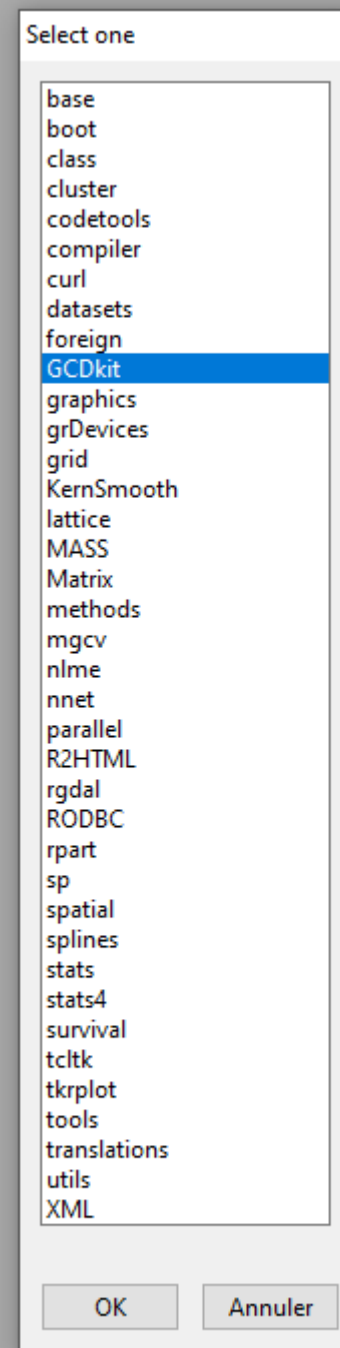
> local({pkg <- select.list(sort(.packages(all.available = TRUE)),graphics=TRUE)
+ if(nchar(pkg)) library(pkg, character.only=TRUE)})
> |
```

7. Lancer GCD Kit

Via le raccourci sur le bureau

Ou via la console R

Package/charger le package/



Menu for R Console

Processing..... done!

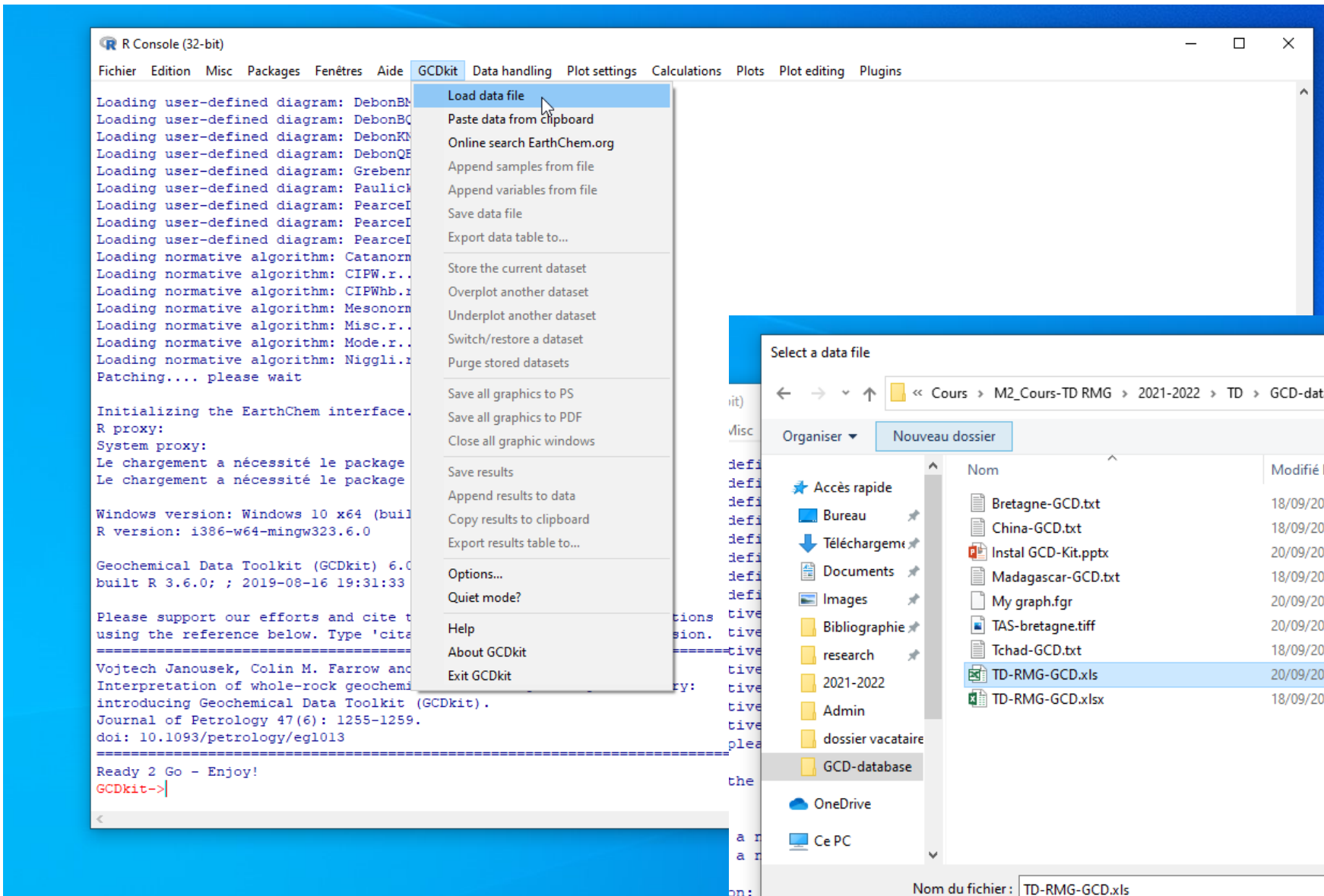
#####

Variable: K2O/Na2O

#####

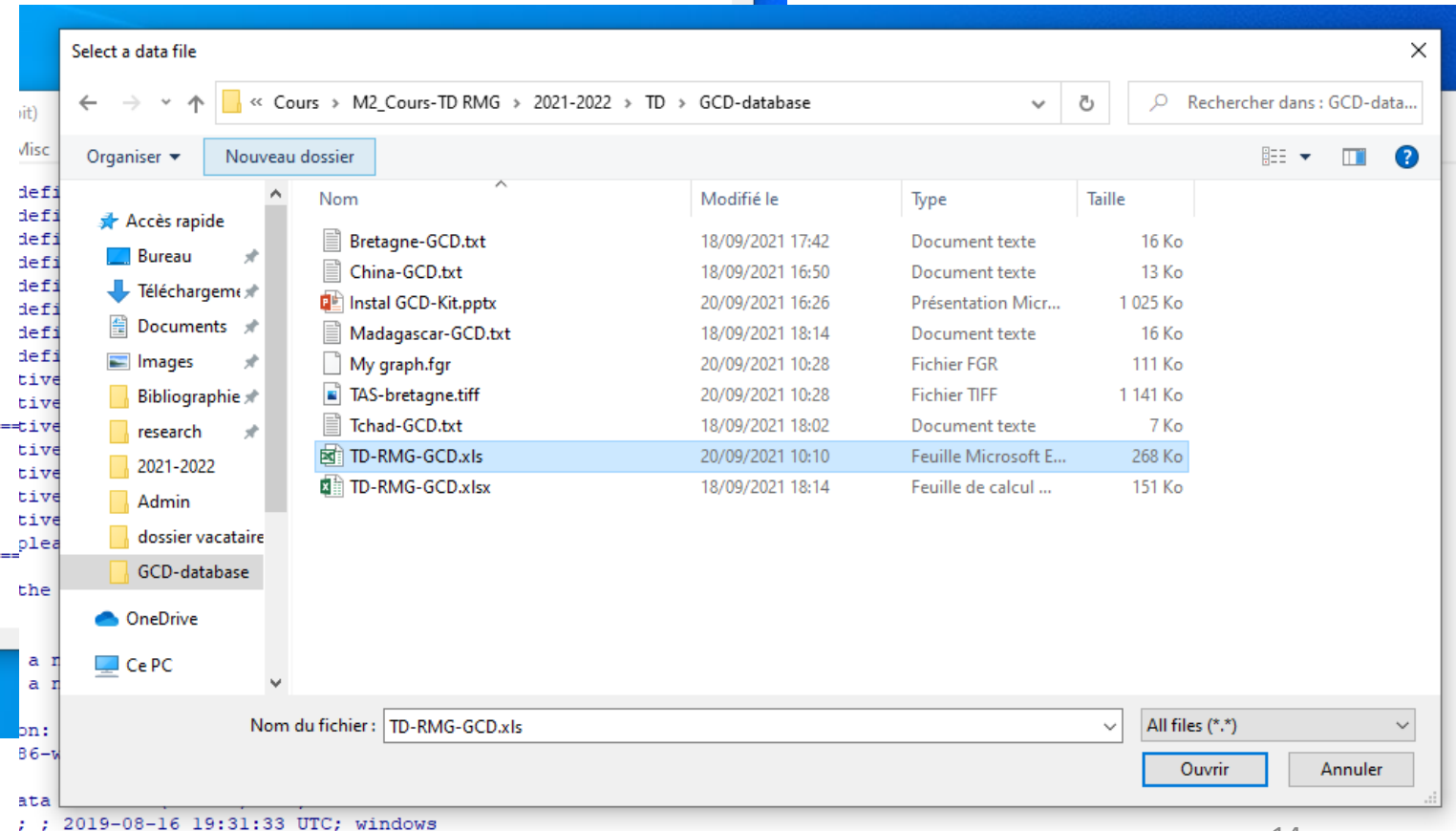
GCDkit menu

	n	NA	Mean	Std	Min	25%	50%	75%	Max
Blatná	49	0	1.360604	0.393273	0.913043	1.131661	1.255663	1.440000	3.205882
Čertovo břemeno	32	0	2.742608	0.859293	1.871429	2.131649	2.440757	3.177518	5.373134
Říčany	33	0	1.449610	0.213321	1.093750	1.311828	1.457865	1.573964	2.165385
Sázava	43	0	0.652831	0.270945	0.431429	0.506680	0.572127	0.658780	1.984733



Importer les données
géochimiques

(* .txt ; * .csv ; * .xls)



```
R Console (32-bit)
Fichier  Edition  Misc  Packages  Fenêtres  Aide  GCDkit  Data handling  Plot settings  Calculations  Plots  Plot editing  Plugins

Loading user-defined diagram: DebonKNaB.r.....Syntax ok
Loading user-defined diagram: DebonQB.r.....Syntax ok
Loading user-defined diagram: Grebennikov.r.....Syntax ok
Loading user-defined diagram: Paulick.r.....Syntax ok
Loading user-defined diagram: PearceDestructive1.r.....Syntax ok
Loading user-defined diagram: PearceDestructive2.r.....Syntax ok
Loading user-defined diagram: PearceDestructive3.r.....Syntax ok
Loading normative algorithm: Catanorm.r.....Syntax ok
Loading normative algorithm: CIPW.r.....Syntax ok
Loading normative algorithm: CIPWhb.r.....Syntax ok
Loading normative algorithm: Mesonorm.r.....Syntax ok
Loading normative algorithm: Misc.r.....Syntax ok
Loading normative algorithm: Mode.r.....Syntax ok
Loading normative algorithm: Niggli.r.....Syntax ok
Patching.... please wait

Initializing the EarthChem interface....
R proxy:
System proxy:
Le chargement a nécessité le package : XML
Le chargement a nécessité le package : utils

Windows version: Windows 10 x64 (build 19042)
R version: i386-w64-mingw32 3.6.0

Geochemical Data Toolkit (GCDkit) 6.0,
built R 3.6.0; ; 2019-08-16 19:31:33 UTC; windows

Please support our efforts and cite the package 'GCDkit' in publications
using the reference below. Type 'citation("GCDkit")' for BibTex version.
=====
Vojtech Janousek, Colin M. Farrow and Vojtech Erban (2006).
Interpretation of whole-rock geochemical data in igneous geochemistry:
introducing Geochemical Data Toolkit (GCDkit).
Journal of Petrology 47(6): 1255-1259.
doi: 10.1093/petrology/egl013
=====

Ready 2 Go - Enjoy!
GCDkit->loadData()
Excel file...loading...
```

Sélectionner la feuille
Excel (ou txt ou csv)
correspondante

*NB: Dans les bases
données, les éléments
majeurs sont fournis en
poids.% d'oxyde et les
traces en ppm ($\mu\text{g/g}$).*

*LOI (loss on ignition) =
PF (perte au feu) en
poids.%*

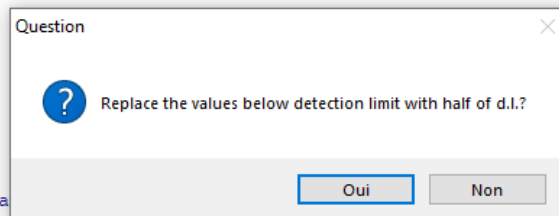
*Fluor en ppm sauf pour
le TD 'bretagne'
(pds.%)*

```
R Console //GCDkit - TD-RMG-GCD.xls 17:11:07
Fichier Edition Misc Packages Fenêtres Aide GCDkit Data handling Plot settings Calculations Plots Plot editing Plugins

GCDkit-> excelExport()
Writing a table .....ok
GCDkit-> showLegend(GUI=TRUE)
GCDkit-> loadData()
Excel file...loading...
...ok
D:\research\postdoc-Nancy\Cours\M2_Cours-TD RMG\2021-2022\TD\GCD-database\TD-RMG-GCD.xls
.....
Variable names:
1
"Facies"

...
Facies :
      MsG      MsLC      MsLCm      MsLF Pegmatite
      1         8         6         3         3

Loading plugin: disclosure.r.....Syntax ok
Loading plugin: isocon.r.....Syntax ok
Loading plugin: JungAlTitemp.r.....Syntax ok
Loading plugin: projbiot.r.....Syntax ok
Loading plugin: saturation.r.....Syntax ok
Loading plugin: SrNd.r...WARNING: Skipping: No Sr-Nd isotopic da
...Syntax ok
Loading plugin: tcltk2.r.....Syntax ok
Loading plugin: tetrad.r.....Syntax ok
Processing...Please wait...
Identifying the data types present...
Major elements
..... done!
Trace elements
..... done!
Available datasets:
[1] "TD-RMG-GCD.xls"          "TD-RMG-GCD.xls 16:56:32" "cameroon.data"          "TD-RMG-GCD.xls 17:11:07"
GCDkit-> loadData()
Excel file...loading...
...ok
D:\research\postdoc-Nancy\Cours\M2_Cours-TD RMG\2021-2022\TD\GCD-database\TD-RMG-GCD.xls
```



GCDkit peut automatiquement remplacer les valeurs sous la limite de détection (indiquées e.g. < 10 ou -10) par leur moitié ou par 'NA' (Non applicable).

Ici, les valeurs des limites de détections ne sont pas spécifiées (e.g. bdl ou < L.D.) à part pour la base de donnée 'China' donc cliquer sur 'Non'. Elles seront remplacées par 'NA'

If desired, negative numbers and values '< x' (used by some authors to indicate items below detection limit) can be either replaced by their half (i.e. interpreted as a half of the detection limit) or 'NA'. User is prompted which of these options he prefers.

J.01	1.08	100.25	2070.00		4.80	233.00	20.40	8240.00	183.50	68.50	32.70	45.50	838.00	8.80	26.10	113.50
	2.90	100.00	4950.00	50.00	n.a.	295.00	20.00	1130.00	33.00	55.30	11.30	40.90	380.00	33.60	25.00	129.50
I.04		97.03				302.00	14.00	735.00	30.00	65.40	12.40	36.50	304.00	40.80	116.00	82.70
	1.79	99.20	930.00		70.00	486.00	47.00	#####	449.00	77.00	37.00	38.00	435.00	26.00	57.00	245.00
	2.18	98.30	340.00		60.00	547.00	83.00	#####	482.00	65.00	73.00	32.00	532.00	19.00	198.00	330.00
	0.50	98.00				705.00	50.00	17195.00	116.00	241.00	65.00	60.00	380.00	13.00	44.00	289.00
I.02	1.30	99.00	560.										611.00	22.00	68.00	787.00
I.04	1.75	94.51	3540.										1420.00	151.00	149.00	2950.00
J.01	1.19	98.25	410.										270.00	30.20	81.50	503.00
J.01	3.70	98.14	740.										919.00	34.40	653.00	768.00
I.07	0.76	96.33											674.00	29.95	60.11	489.90
I.02	3.12	98.62											201.41	21.15	13.90	98.17
I.05	0.40	100.75											241.00	54.80	155.50	73.50
I.32	5.22	100.59											153.00	166.50	521.00	37.30
I.07	2.58	98.57											277.01	11.52	24.47	54.89
I.06	4.44	100.77	2140.										275.00	40.80	17.80	63.50
I.03	1.33	100.12											167.50	4.05	12.80	17.08
J.01	1.30	99.21											228.00	5.30	12.20	23.50
I.08	4.70	98.97				99.23	4.86	361.36	7.21	16.10	3.29	24.98	256.54	12.72	39.89	29.24
I.02	1.14	100.35	1890.00		3.80	252.00	18.90	1240.00	32.30	59.20	13.45	48.30	374.00	20.30	32.90	111.50
I.65	6.85	100.20	1350.00		6.80	91.00	5.50	329.00	8.00	8.34	1.78	24.40	64.10	888.00	751.00	31.50
J.31	3.41	99.10				45.50	2.60	131.00	3.40	5.59	1.27	16.50	91.50	553.00	590.00	21.50
I.37	6.40	100.99				80.20	4.50	219.00	5.60	9.30	2.04	18.80	120.00	646.00	788.00	33.20
I.10	1.89	101.84				63.20	4.10	210.00	5.40	4.37	1.13	23.30	267.00	1290.00	1105.00	43.80
I.03	5.84	100.83				63.50	3.80	212.00	5.30	9.51	1.89	21.40	92.10	424.00	831.00	33.20
I.06	6.14	101.00	740.00			2160.00	56.00	2320.00	52.00	609.00	140.00	46.00	244.00	91.00	360.00	270.00

Question


Do negative values mean that the given item is under detection limit?

Dans notre cas, ces valeurs correspondent aux valeurs en ϵ Nd donc 'non'.

If desired, negative numbers and values '< x' (used by some authors to indicate items below detection limit) can be either replaced by their half (i.e. interpreted as a half of the detection limit) or 'NA'. User is prompted which of these options he prefers.

```
R Console (32-bit)
Fichier Edition Misc Packages Fenêtres Aide GCDkit Data handling Plot settings Calculations Plots Plot editing Plugins

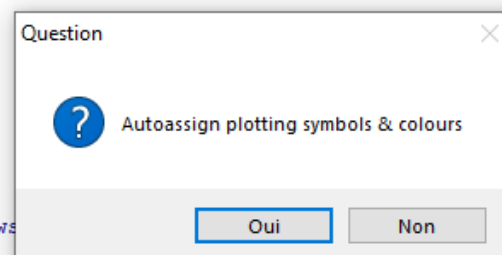
Loading user-defined diagram: Paulick.r.....Syntax ok
Loading user-defined diagram: PearceDestructive1.r.....Syntax ok
Loading user-defined diagram: PearceDestructive2.r.....Syntax ok
Loading user-defined diagram: PearceDestructive3.r.....Syntax ok
Loading normative algorithm: Catanorm.r.....Syntax ok
Loading normative algorithm: CIPW.r.....Syntax ok
Loading normative algorithm: CIPWhb.r.....Syntax ok
Loading normative algorithm: Mesonorm.r.....Syntax ok
Loading normative algorithm: Misc.r.....Syntax ok
Loading normative algorithm: Mode.r.....Syntax ok
Loading normative algorithm: Niggli.r.....Syntax ok
Patching.... please wait

Initializing the EarthChem interface....
R proxy:
System proxy:
Le chargement a nécessité le package : XML
Le chargement a nécessité le package : utils

Windows version: Windows 10 x64 (build 19042)
R version: i386-w64-mingw32 3.6.0

Geochemical Data Toolkit (GCDkit) 6.0,
built R 3.6.0; ; 2019-08-16 19:31:33 UTC; windows

Please support our efforts and cite the package 'GCDkit' in publications
using the reference below. Type 'citation("GCDkit")' for BibTex version.
=====
Vojtech Janousek, Colin M. Farrow and Vojtech Erban (2006).
Interpretation of whole-rock geochemical data in igneous geochemistry:
introducing Geochemical Data Toolkit (GCDkit)
```



Sélectionner la variable (nom de colonne)
pour l'attribution automatique des symboles
(dans cet exemple c'est la colonne 'facies')

```
ckage : XML
ckage : utils
```

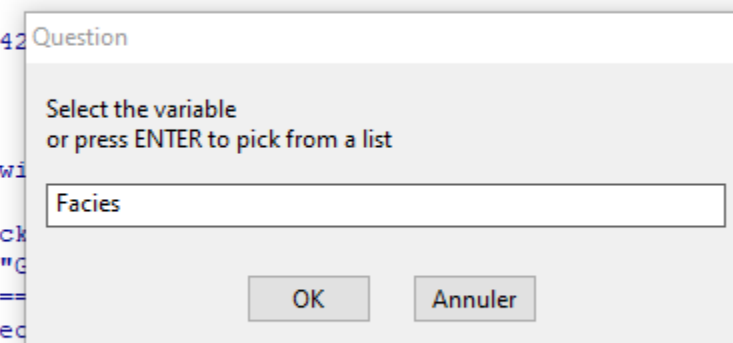
```
(build 19042)
0
```

```
t) 6.0,
31:33 UTC; wi
```

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```

```
ow and Vojtec
ochemical data in igneous geochemistry:
```

```
olkit (GCDkit).
5-1259.
```



The screenshot displays the GCDkit software interface, which is used for creating facies maps. It consists of several windows:

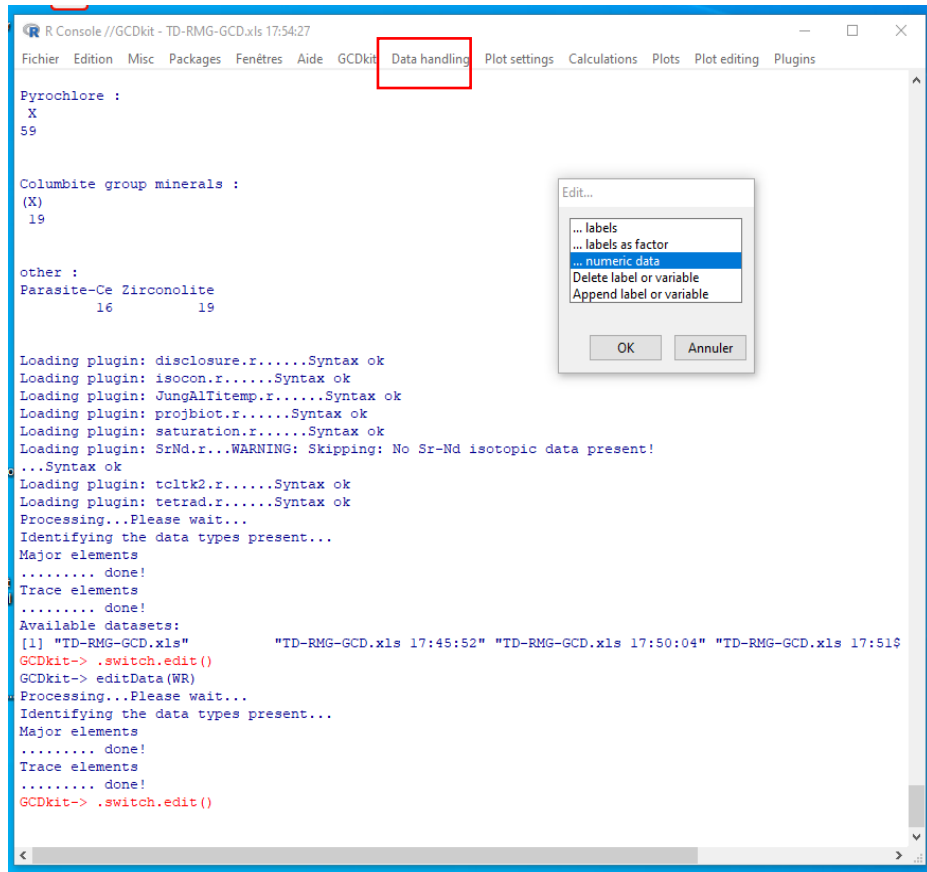
- Editeur de données (Data Editor):** A window for editing data. It contains a table with columns: Name, Symbol, Colour, var4, var5, var6, var7, var8, var9. The first five rows are pre-filled with data for 'MsG', 'MsLC', 'MsLCm', 'MsLF', and 'Pegmatite'.
- R Graphics: Device 2 (ACTIVE):** A window showing a 7x7 grid of colored squares, each containing a number from 1 to 49. This grid represents the spatial distribution of facies codes.
- R Graphics: ...:** A window showing a list of symbols and shapes that can be assigned to facies codes. The symbols include various geometric shapes and patterns, each associated with a number from 0 to 19.

GCDkit va automatiquement attribuer une couleur et un symbole particulier à chaque 'faciès'.

Vous pouvez changer le code de couleur et de symbole manuellement dans GCDkit via l'éditeur de données.
(ou choisir de prédéfinir ce code dans la feuille Excel en insérant une colonne 'Symbol' et 'Colour' avant de l'importer dans GCDkit).

Une fois le code attribué, fermer l'éditeur de données

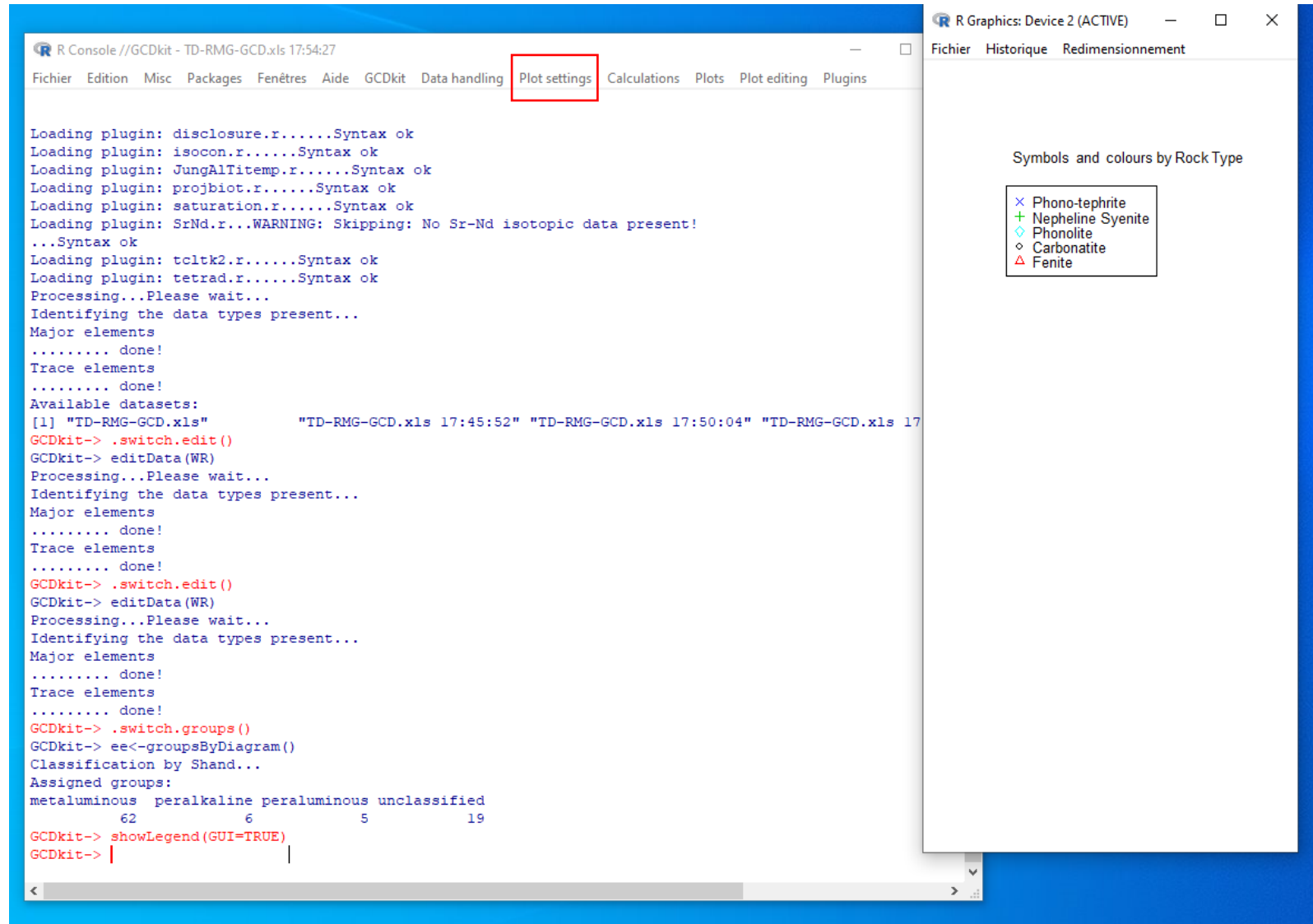
- L'onglet 'GCD-Kit' vous permet de sauver votre projet en l'exportant dans un fichier Excel (.xls)
- L'onglet Data Handling vous permet de voir votre tableau de données et de l'éditer. La première chose à faire est de vérifier qu'il n'y a pas eu de problème au moment de l'importation depuis Excel et que toutes vos colonnes/données sont là.



row.names	SiO2	Al2O3	Fe2O3	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	LOI	Total
1 NLOFR10251	43.26	13.74	9.05	0.269	6.63	7.57	4.16	4.72	1.869	0.38	7.28	98.93
2 NLOFR10253	44.15	13.81	8.62	0.249	6.51	7.27	3.8	4.67	1.795	0.38	6.93	98.2
3 NLOFR10254	44.84	14.36	8.73	0.179	6.26	7.16	3.98	4.56	1.876	0.41	7.12	99.46
4 NLOFR10259	46.07	13.94	9.77	0.258	5.7	6.68	4.38	4.07	1.971	0.45	6.45	99.74
5 NLOFR10260	44.34	13.95	9.23	0.215	6.84	7.63	3.96	4.2	1.955	0.41	6.95	99.68
6 NLOFR10266	45.34	14.34	8.96	0.186	6.4	6.8	4.34	4.32	1.949	0.39	6.22	99.24
7 NLOFR10267	43.21	13.67	9.47	0.262	5.67	7.74	4.8	3.65	1.85	0.41	8.31	99.05
8 NLOFR10463	45.32	14.42	9.08	0.277	6.25	6.08	4.72	4.42	1.999	0.4	5.88	98.84
9 NLOFR18785	45.54	14.38	9.39	0.2	6.46	7.65	3.99	3.64	1.982	0.41	4.59	98.24
10 NLOFR18786	45.5	14	9.32	0.211	6.56	8.03	4.03	3.79	1.936	0.4	4.95	98.74
11 NLOFR18787	45.29	14.31	9.86	0.188	7.1	7.54	3.72	4.09	1.937	0.42	6.47	100.9
12 NLOFR18788	46.28	14.57	9.11	0.153	6.56	7.39	4.24	3.28	1.905	0.42	6.82	100.7
13 NLOFR18789	45.3	14.25	9.42	0.248	5.75	6.63	4.85	4.02	1.965	0.45	5.73	98.61
14 NLOFR18791	44.61	13.61	9.7	0.254	5.79	7.34	4.83	3.92	1.783	0.5	7.18	99.52
15 NLOFR10293	51.67	17.71	5.4	0.202	0.17	4.49	6.26	6.83	0.319	0.07	5.2	98.32
16 NLOFR10300	45.24	20.28	6.19	0.248	0.64	5.76	8.85	4.7	0.559	0.62	6.91	99.99
17 NLOFR10306	44.31	20.26	1.93	0.195	0.05	7.69	8.46	6.58	0.907	0.8	8.46	99.64
18 NLOFR10307	50.82	22.66	5.23	0.188	0.16	1.43	11.68	4.84	0.34	0.03	3.53	100.9
19 NLOFR10346	45.34	21.41	5.25	0.232	0.5	5.59	8.99	5.06	0.498	0.46	5.85	99.18
20 NLOFR10350	49.96	22.67	5.29	0.186	0.28	2.63	6.73	7.21	0.524	0.13	4.39	99.99
21 NLOFR10353	49.74	20.23	5.53	0.13	0.43	2.82	6.59	8.3	0.724	0.07	4.68	99.25
22 NLOFR10500	49.12	16.39	7.06	0.257	2.16	5.58	6.83	4.65	1.015	0.34	5.19	98.6
23 NLOFR18770	49.02	19.85	2.69	0.142	0.12	4.83	7.34	7.28	0.716	0.38	5.68	98.06
24 NLOFR18513	50.22	19.03	5.44	0.188	0.22	4.33	5.88	7.55	0.399	0.15	4.77	98.19

- L'onglet Data Handling vous permet aussi de créer des nouveaux groupes d'échantillons par label (colonne) ou en fonction de leur position dans un diagramme géochimique (e.g. metaluminous vs peraluminous vs. Peralkalin: diagramme de Shand)

- Aller dans 'Plot setting' pour afficher votre légende (display legend). 'Symbols/colours by group' pour changer votre légende en fonction des groupes définis dans 'data handling'. Vous pouvez aussi y modifier la taille des symboles



The screenshot shows the R Console and R Graphics windows. The R Console window displays the following commands and output:

```

R Console //GCDkit - TD-RMG-GCD.xls 17:54:27
Fichier Edition Misc Packages Fenêtres Aide GCDkit Data handling Plot settings Calculations Plots Plot editing Plugins

Loading plugin: disclosure.r.....Syntax ok
Loading plugin: isocon.r.....Syntax ok
Loading plugin: JungAlTitemp.r.....Syntax ok
Loading plugin: projbiot.r.....Syntax ok
Loading plugin: saturation.r.....Syntax ok
Loading plugin: SrNd.r...WARNING: Skipping: No Sr-Nd isotopic data present!
...Syntax ok
Loading plugin: tcltk2.r.....Syntax ok
Loading plugin: tetrad.r.....Syntax ok
Processing...Please wait...
Identifying the data types present...
Major elements
..... done!
Trace elements
..... done!
Available datasets:
[1] "TD-RMG-GCD.xls" "TD-RMG-GCD.xls 17:45:52" "TD-RMG-GCD.xls 17:50:04" "TD-RMG-GCD.xls 17:54:27"
GCDkit-> .switch.edit()
GCDkit-> editData(WR)
Processing...Please wait...
Identifying the data types present...
Major elements
..... done!
Trace elements
..... done!
GCDkit-> .switch.edit()
GCDkit-> editData(WR)
Processing...Please wait...
Identifying the data types present...
Major elements
..... done!
Trace elements
..... done!
GCDkit-> .switch.groups()
GCDkit-> ee<-groupsByDiagram()
Classification by Shand...
Assigned groups:
metaluminous peralkaline peraluminous unclassified
62 6 5 19
GCDkit-> showLegend(GUI=TRUE)
GCDkit-> |

```

The R Graphics window shows the legend titled "Symbols and colours by Rock Type":

- × Phono-tephrite
- + Nepheline Syenite
- ◇ Phonolite
- ◇ Carbonatite
- △ Fenite

- L'onglet 'calculations' vous permet de calculer des nouvelles variables qui seront ajoutées sous forme de colonne à votre tableau de donnée. Par exemple des rapports type Nb/Ta, Zr/Hf, K/Rb, etc...

The image displays two screenshots of the R Graphical User Interface (GCDkit) used for geochemical data analysis.

Left Screenshot: Shows the 'Calculations' menu open, with the option 'Calculate a new variable' highlighted. The background window shows the R console output, including plugin loading messages and the start of data processing.

Right Screenshot: Shows the R console output with the following commands and results:

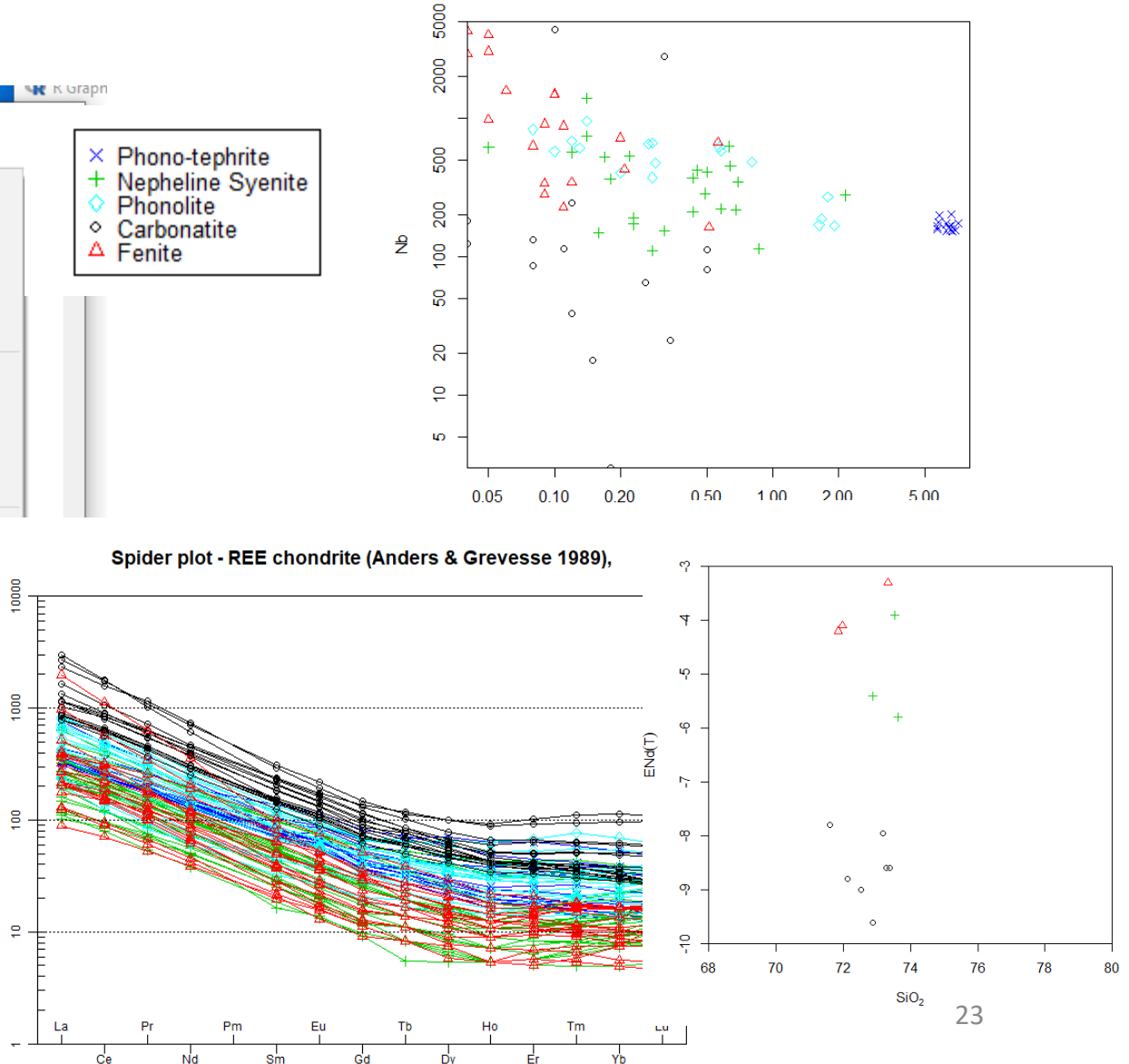
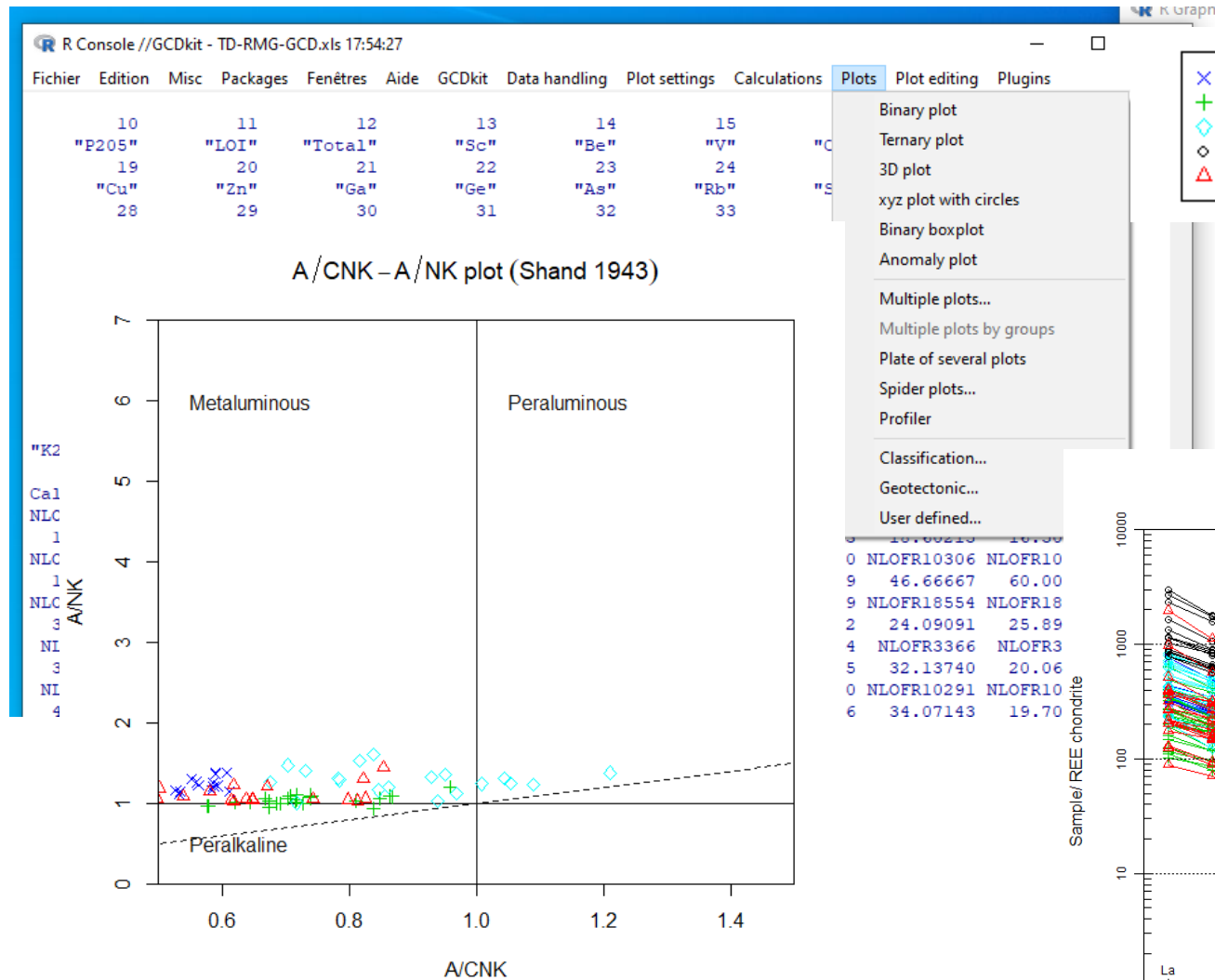
```
GCDkit-> .switch.edit()
GCDkit-> editData(WR)
Processing...Please wait...
Identifying the data types present...
Major elements
..... done!
Trace elements
..... done!
GCDkit-> .switch.groups()
GCDkit-> ee<-groupsByDiagram()
Classification by Shand...
Assigned groups:
metaluminous peralkaline peraluminous unclassified
62 6 5
GCDkit-> showLegend(GUI=TRUE)
GCDkit-> x<-calc()
```

A 'Question' dialog box is overlaid on the right screenshot, asking 'Select a variable to calculate, e.g. (SiO2+2.1)*TiO2/3'. The input field contains 'Nb/Ta'.

The background window in the right screenshot displays a table of chemical data:

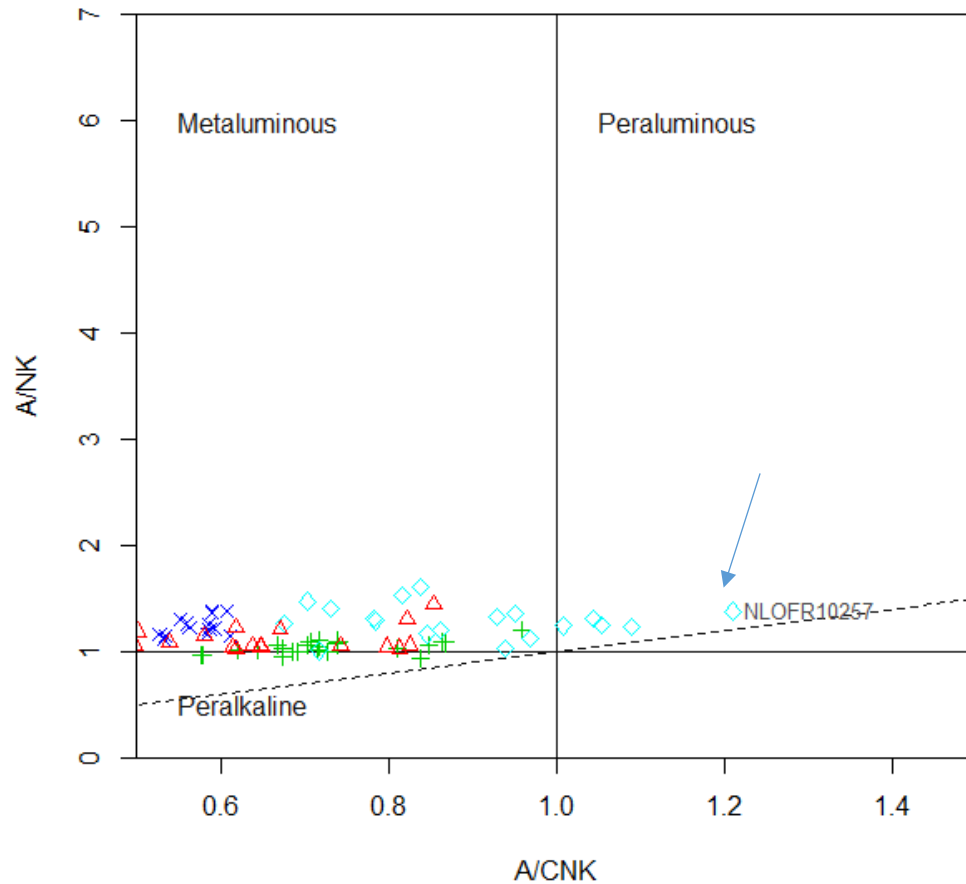
1	2	3	4	9
"SiO2"	"Al2O3"	"Fe2O3"	"MnO"	"TiO2"
10	11	12	13	18
"P2O5"	"LOI"	"Total"	"Sc"	"Ni"
19	20	21	22	27
"Cu"	"Zn"	"Ga"	"Ge"	"Zr"
28	29	30	31	36
"Nb"	"Ta"	"Mo"	"Ag"	"Ba"
37	38	39	40	45
"Bi"	"La"	"Ce"	"Pr"	"Tb"
46	47	48	49	54
"Dy"	"Ho"	"Er"	"Tm"	"Tl"
55	56	57	58	63
"Pb"	"Th"	"U"	"FeO"	"S"
64	65	66	67	72
"P"	"K"	"Ti"	"Cr2O3"	"A/CNK"
73				
"K2O/Na2O"				

- L'onglet 'Plots' vous permet de créer des diagrammes binaires et triangulaires avec sélection manuelle des variables. Vous pouvez définir des échelles logarithmiques si besoin. Il existe aussi plusieurs diagrammes déjà prédéfinis dans les onglets 'classifications' (e.g. Shand, Q-P) et 'geotectonic'. Spiders plots vous permet de tracer des spectres d'éléments traces (ou REE) normalisés à la chondrite ou à d'autres réservoirs (croûte supérieure, manteau primitif, etc....).



- L'onglet 'Plot editing' vous permet d'identifier des échantillons dans des diagrammes (identify point), redéfinir les valeurs des axes (zoom), titres des axes, police, etc...
- Vous pouvez aussi redéfinir des labels/colonnes en fonction de la position des points dans des diagrammes de classification (plot editing/classify): metaluminous vs peralkaline vs peraluminous
- Les graphiques peuvent être exportés en vectoriel ou bitmap (clique droit sur le graphique).

A/CNK – A/NK plot (Shand 1943)



Spider plot – Primitive mantle (McDonough and Sun 1995)

