A Graphical User Interface for Environmental Statistics

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January 16, 2009

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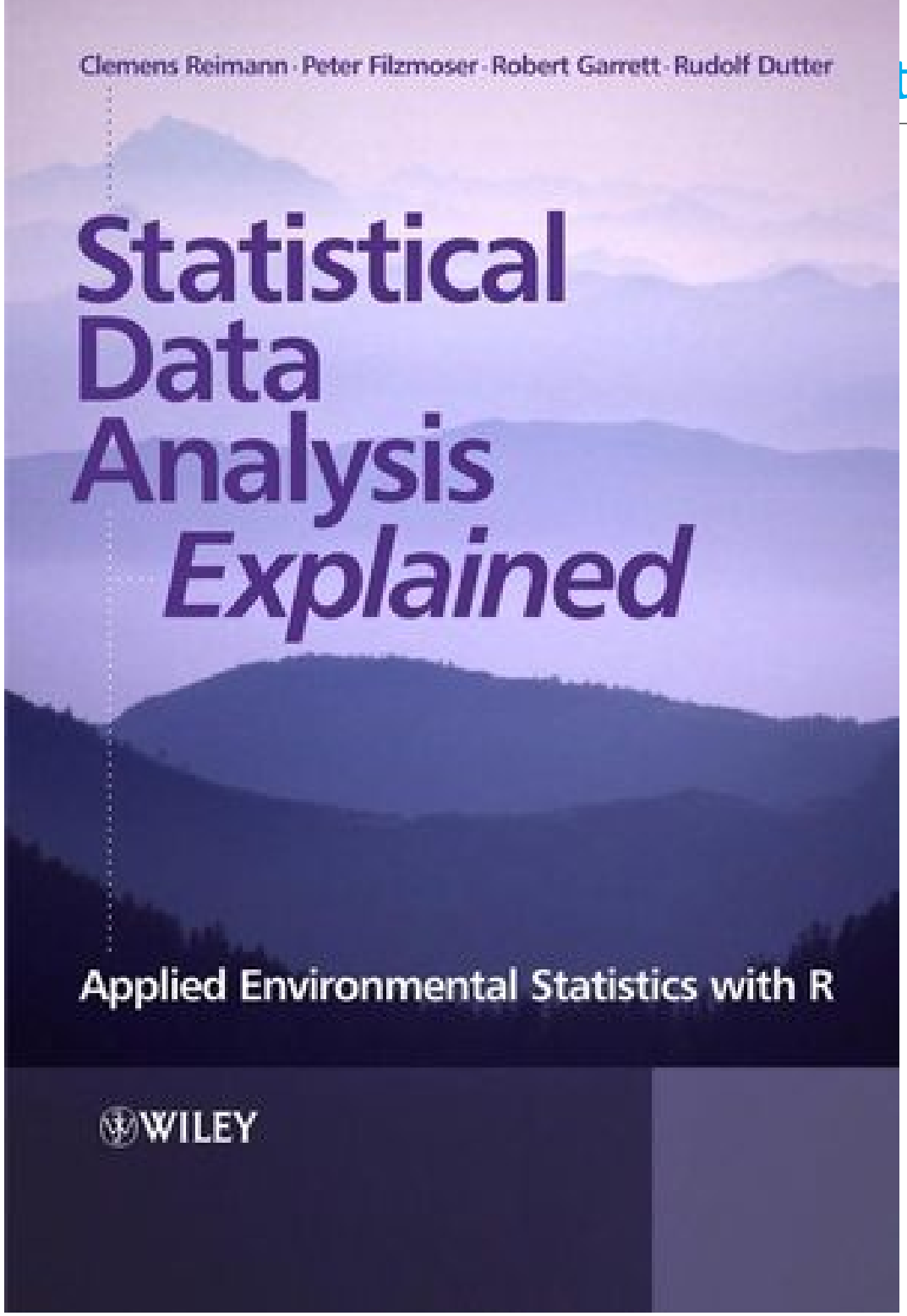


DAS+R a companion of this book (Wiley, 2008).

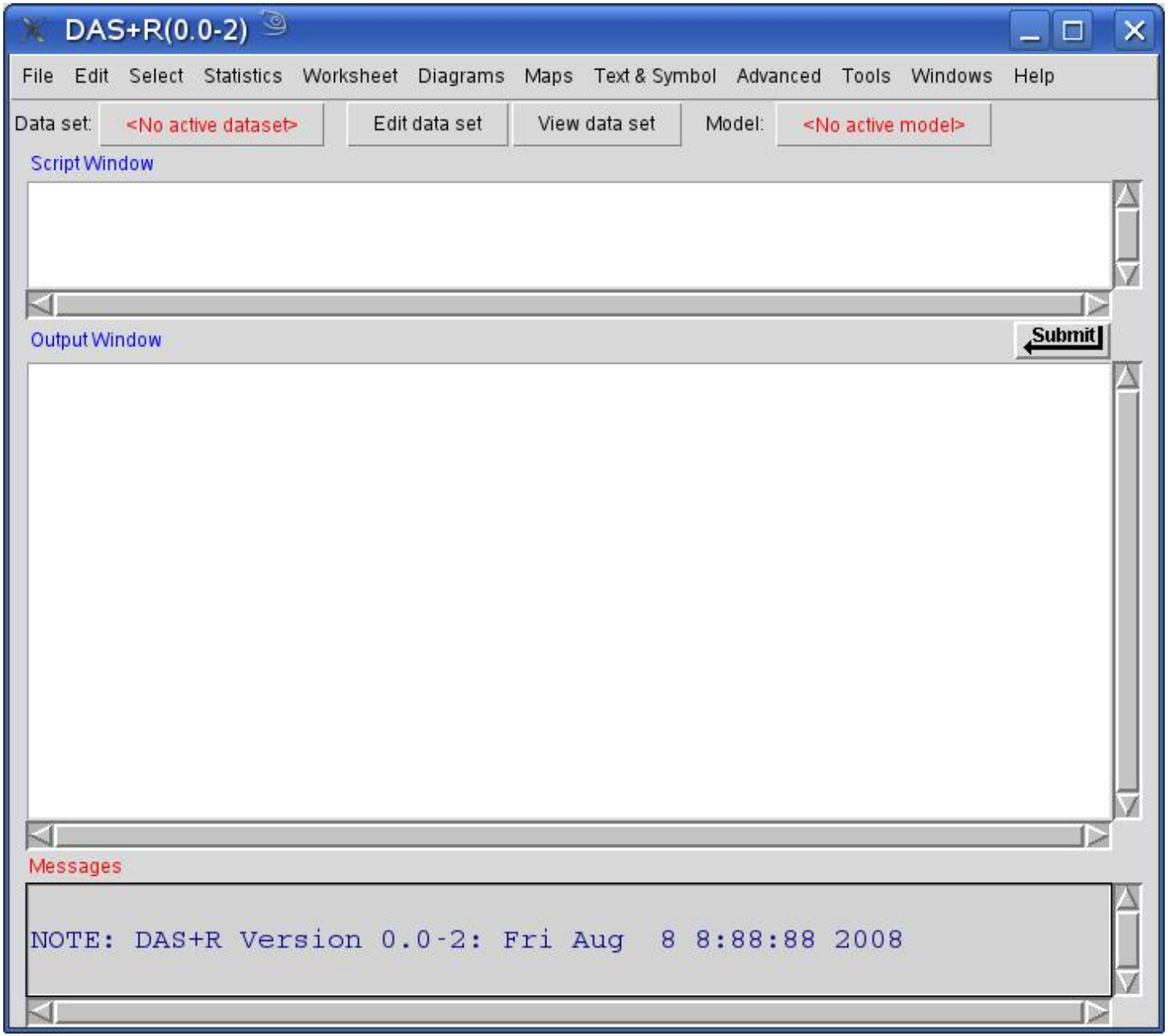
Emphasis:

- Spatial Data
- Strong Graphical Tools
- Data from Geochemistry
- Little Mathematics
- Provided Software: DAS+R

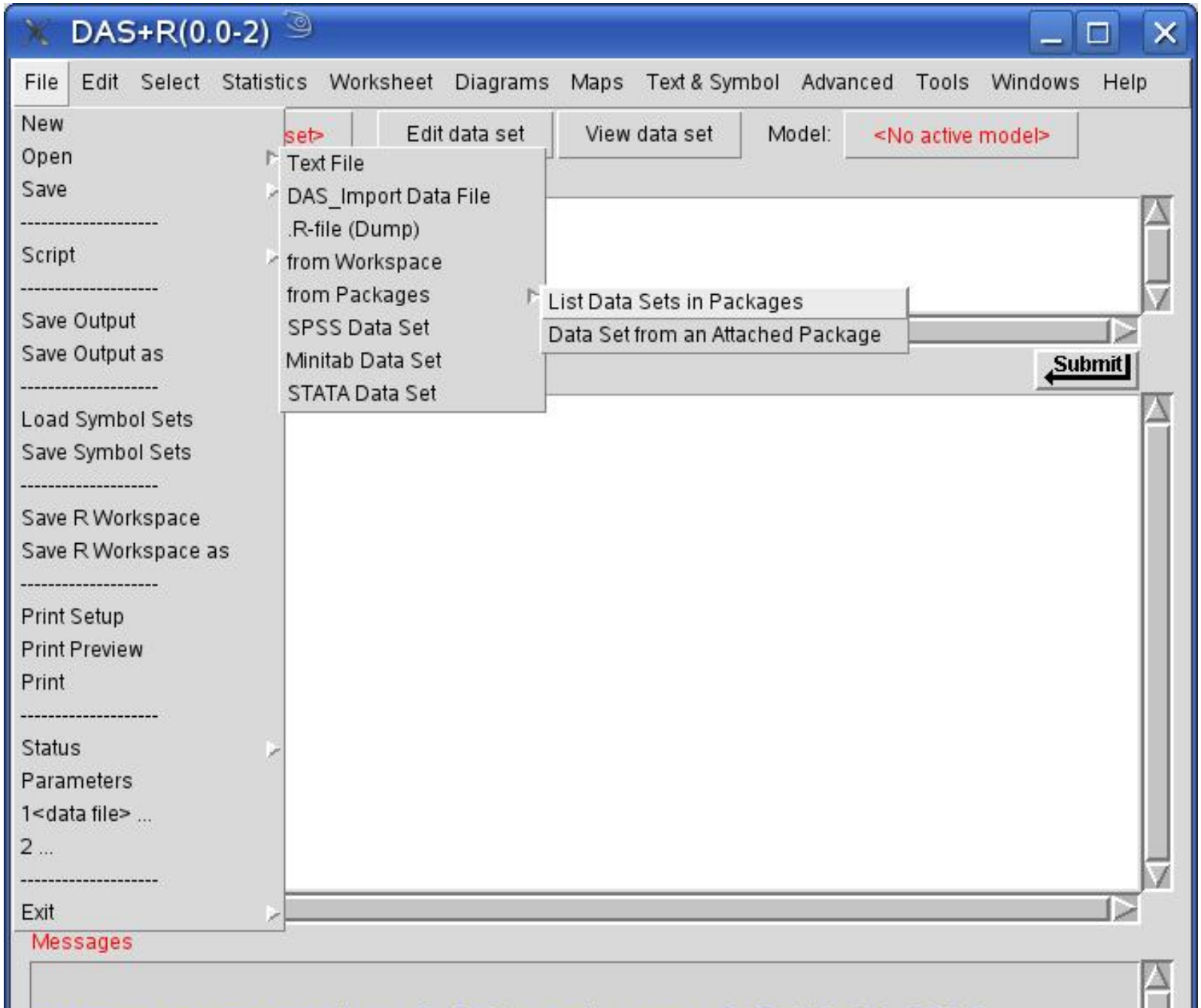
DAS+R (future package of R)

- Basis: DAS, (all) functions of R, Tcl/Tk

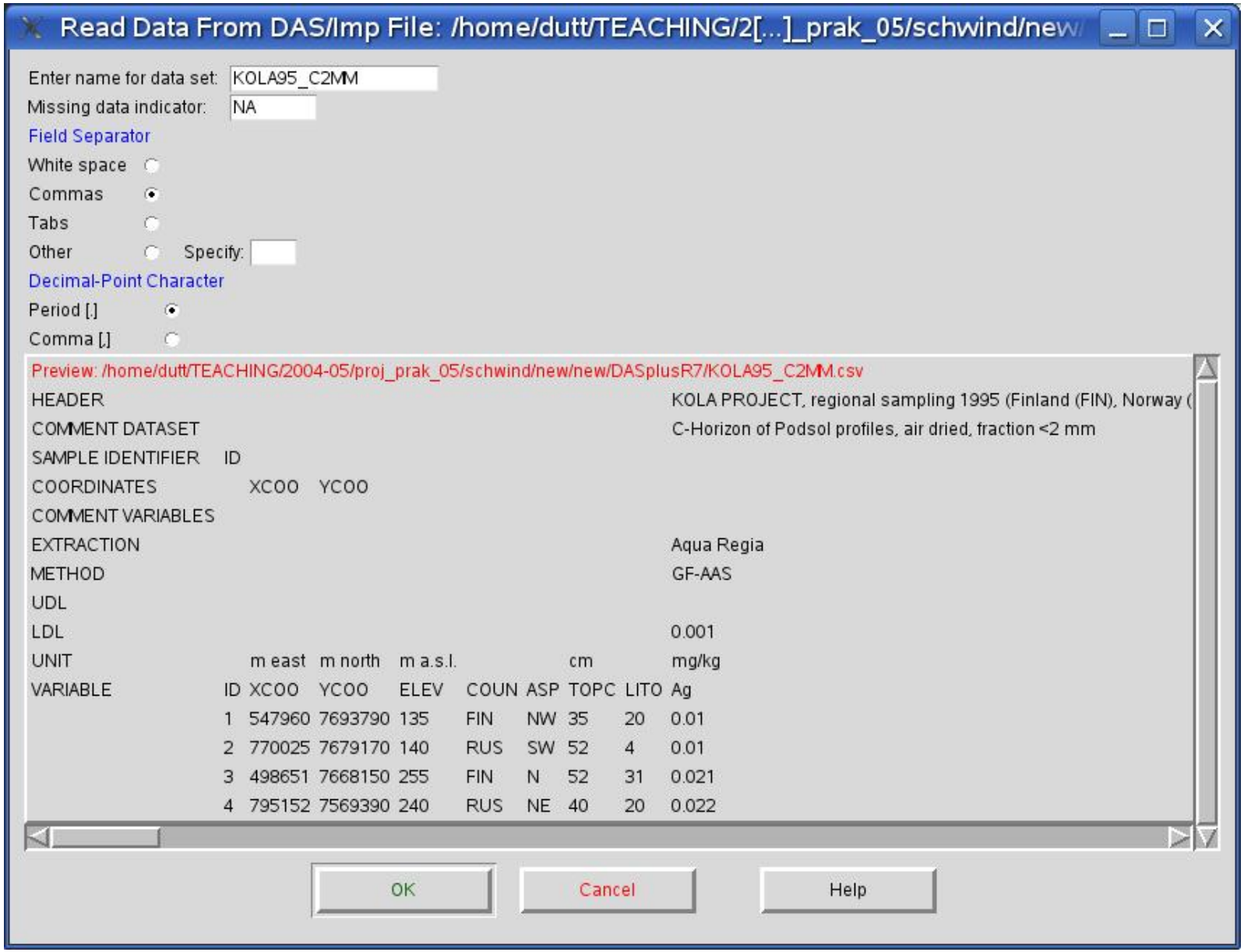
- Emphasis:
  - easy to use (e.g. Rcommander)
  - fast reproducibility (with small changes) of the results
  - interactive definition of subsets (numerically and graphically)
  - strong interaction between statistical data and spatial information
  - graphical analysis


DAS+R(0.0-2)
File Edit Select Statistics Worksheet Diagrams Maps Text & Symbol Advanced Tools Windows Help
Data set:
<No active dataset>
Edit data set
View data set
Model:
<No active model>
Script Window
Output Window
Submit
Messages
NOTE: DAS+R Version 0.0-2: Fri Aug 8 8:88:88 2008

Open Data File

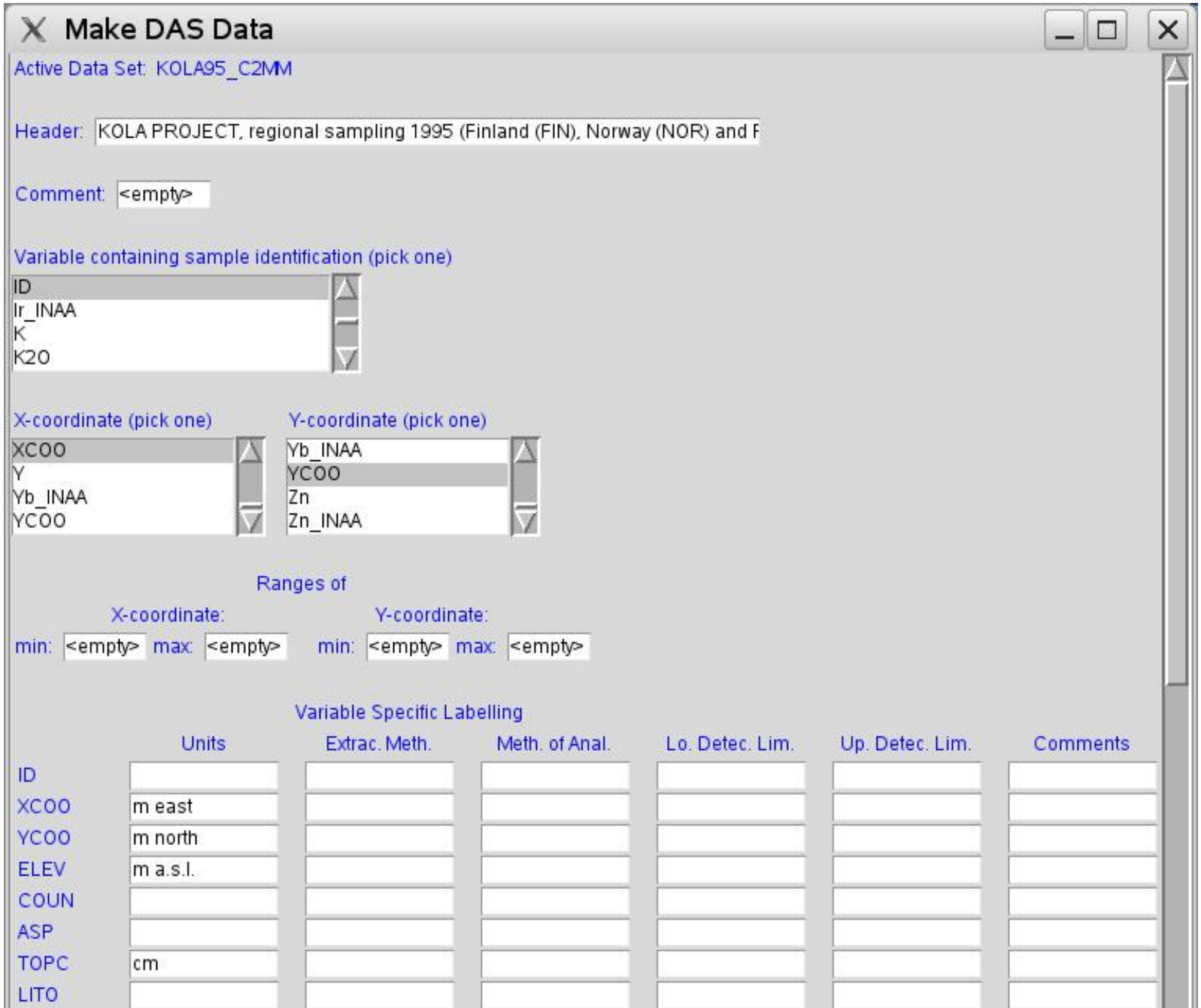


Read DAS/Imp (Preview)

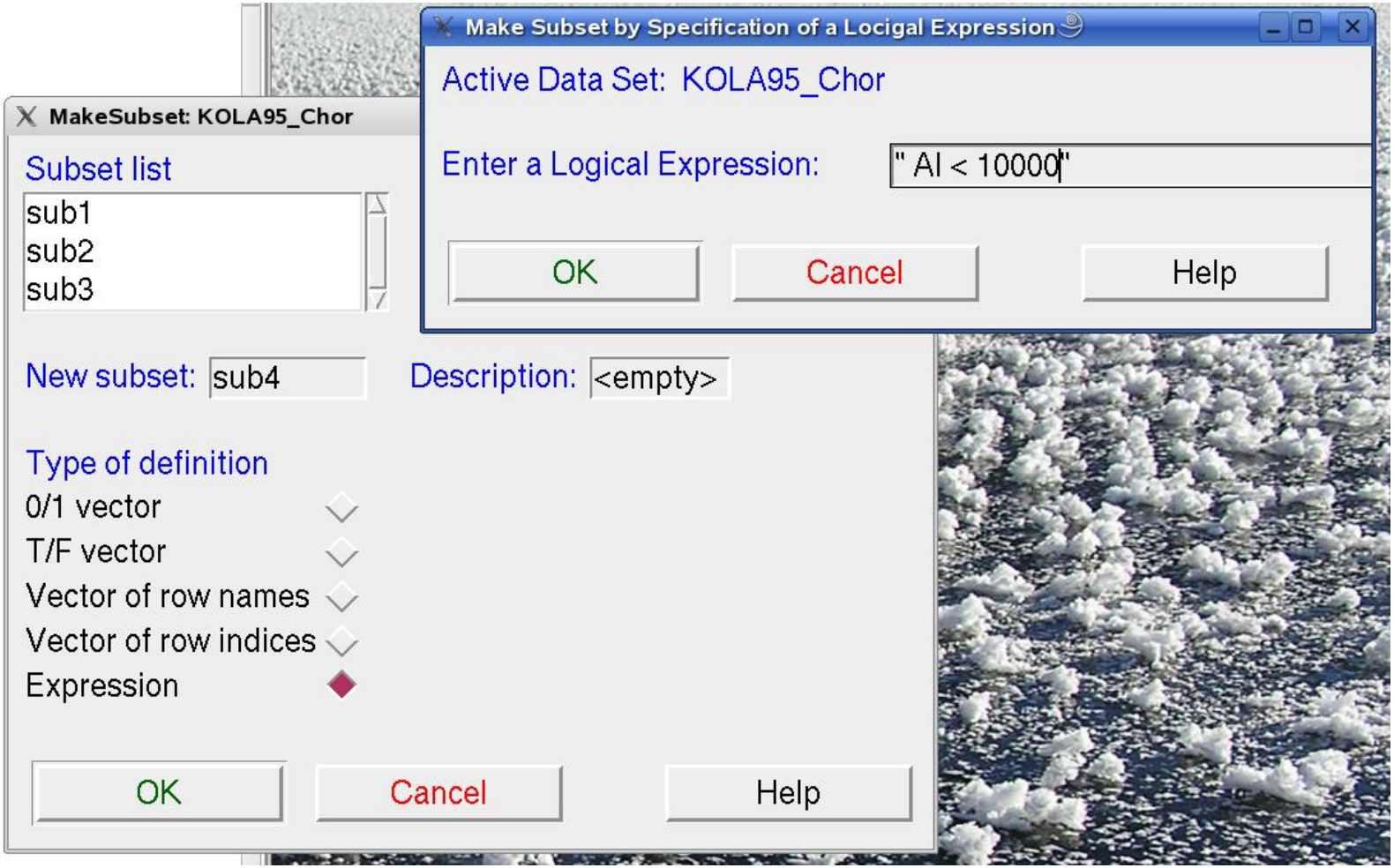


Read DAS/Imp (Types of Variables)

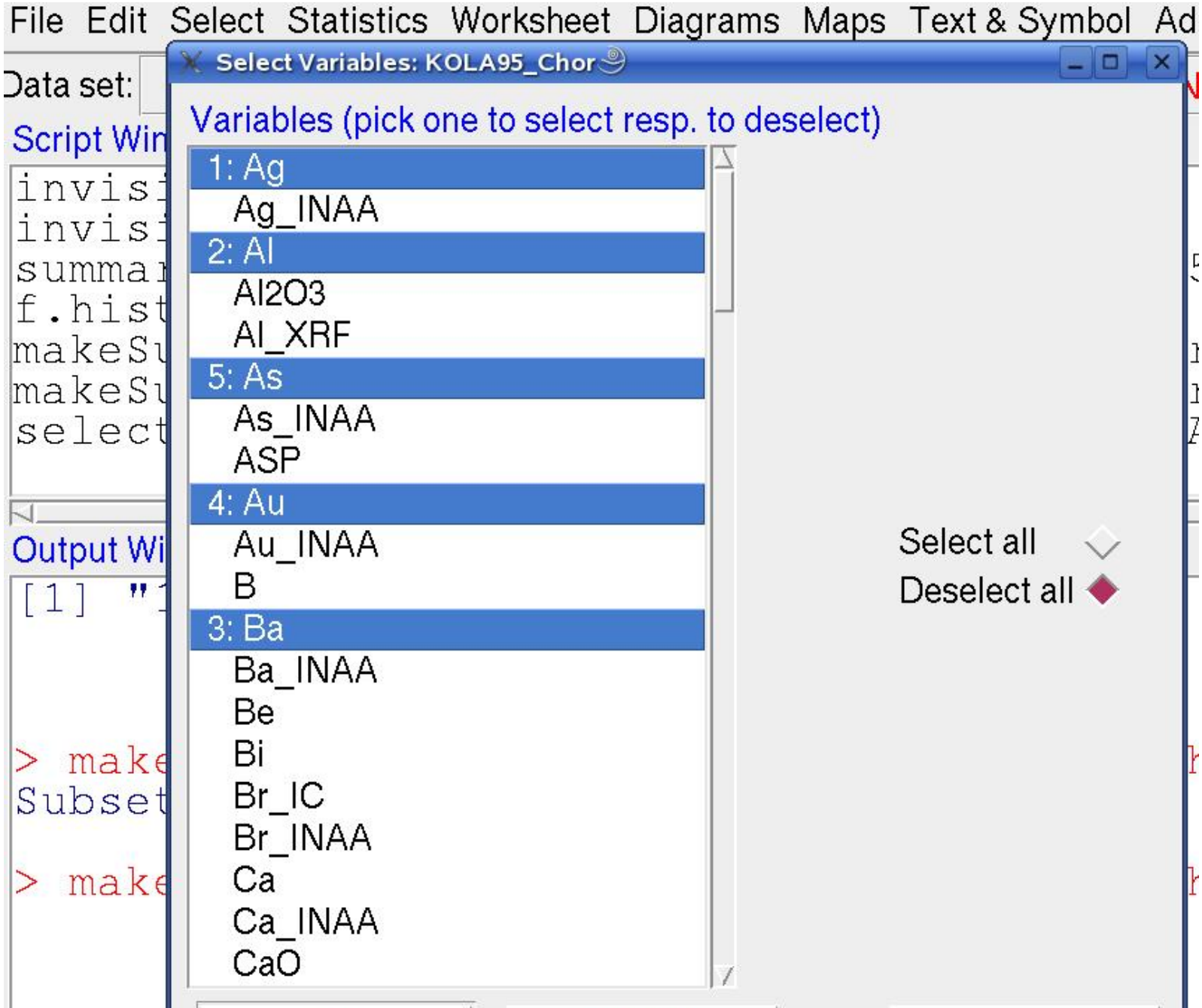
Make DAS Data



Make Subset


Make Subset by Specification of a Locigal Expression
Active Data Set: KOLA95_Chor
Enter a Logical Expression:
" AI < 10000"
OK
Cancel
Help
MakeSubset: KOLA95_Chor
Subset list
sub1
sub2
sub3
New subset: sub4
Description: <empty>
Type of definition
0/1 vector
T/F vector
Vector of row names
Vector of row indices
Expression
OK
Cancel
Help

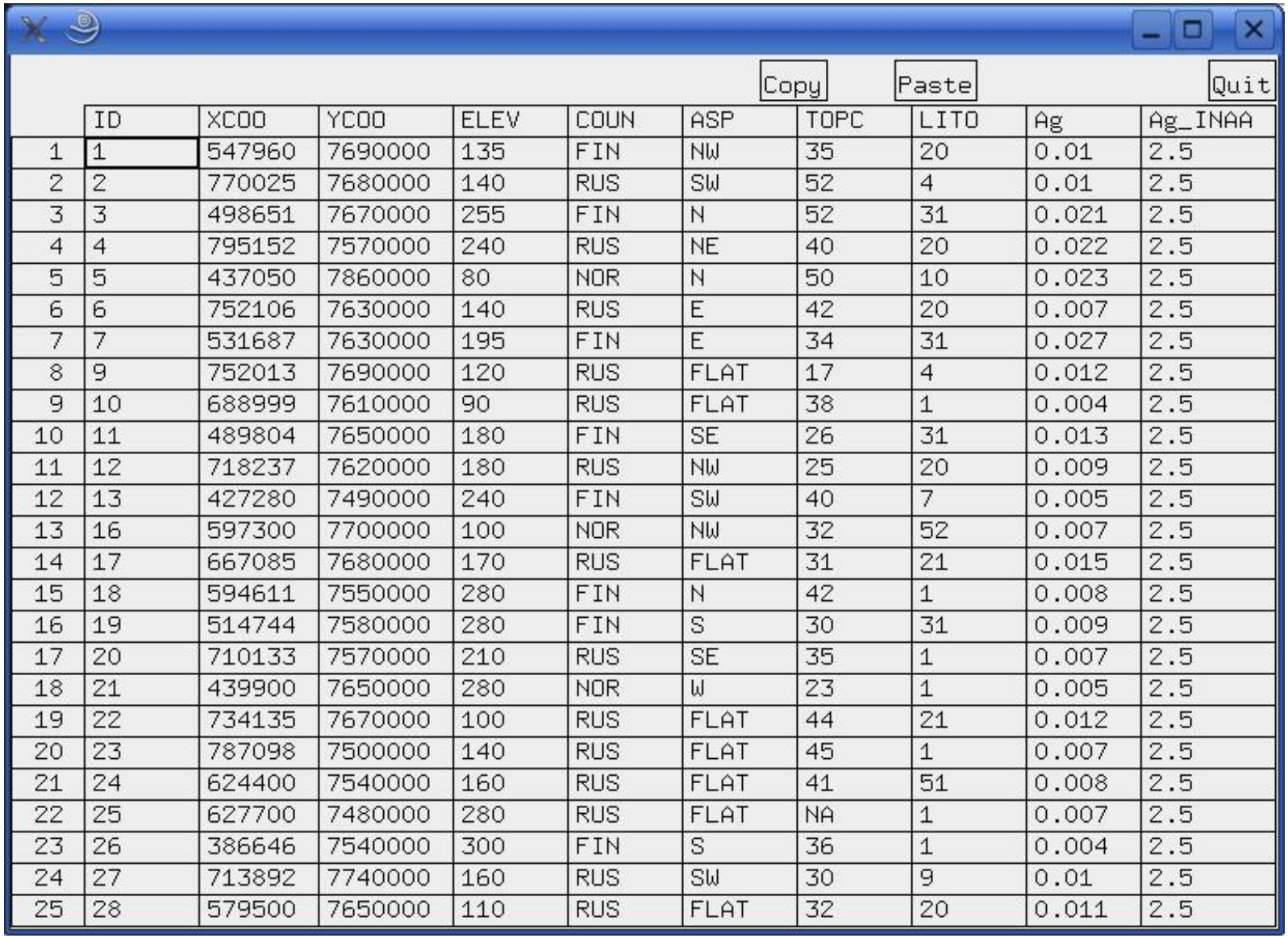
(Pre-)Select Variables



View Data Set

- Numerically
- Graphically
  - Histogram
  - Boxplots
  - xy-plot
  - Ternary Plot
  - Scattermatrix (Draftman)

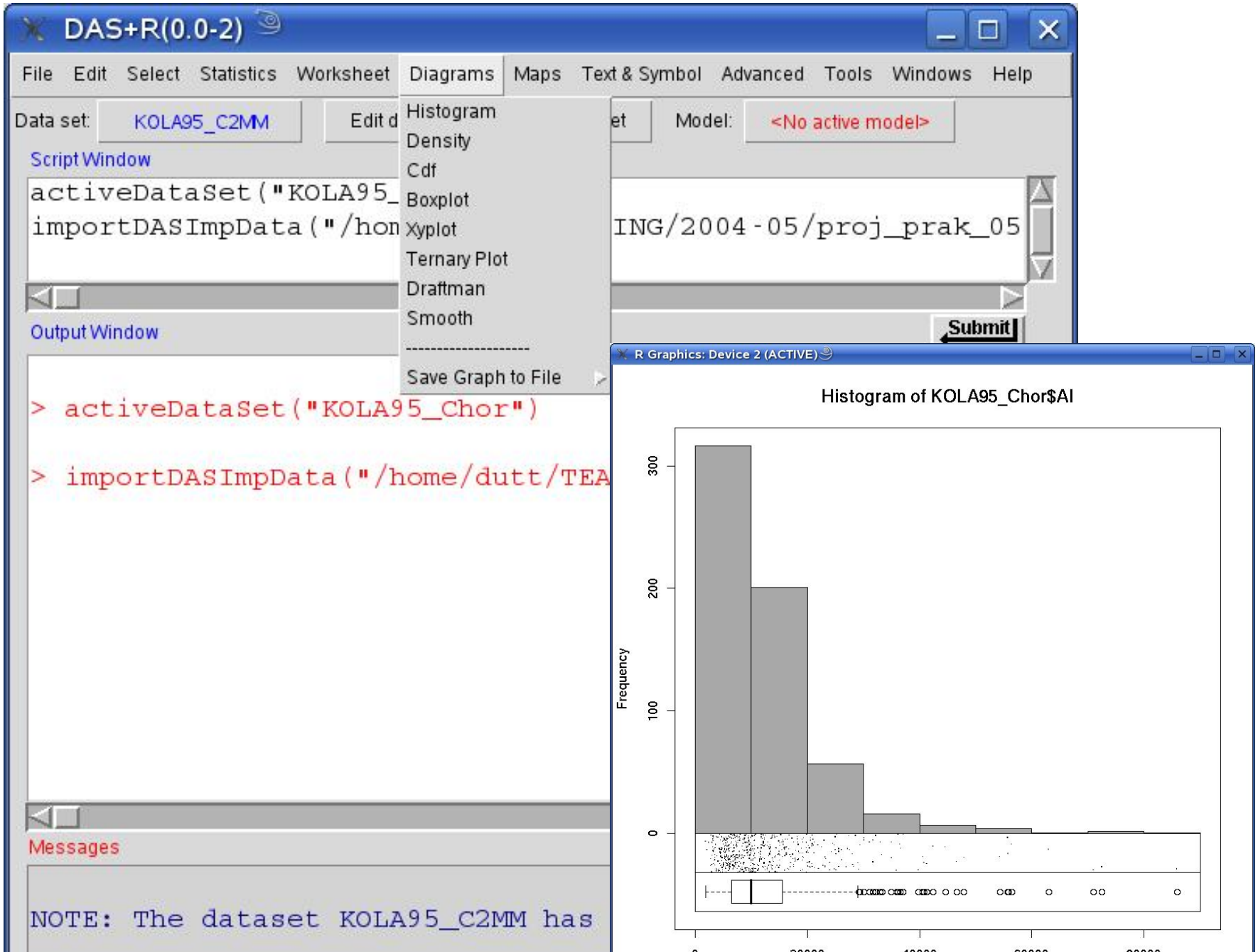
View Data Set



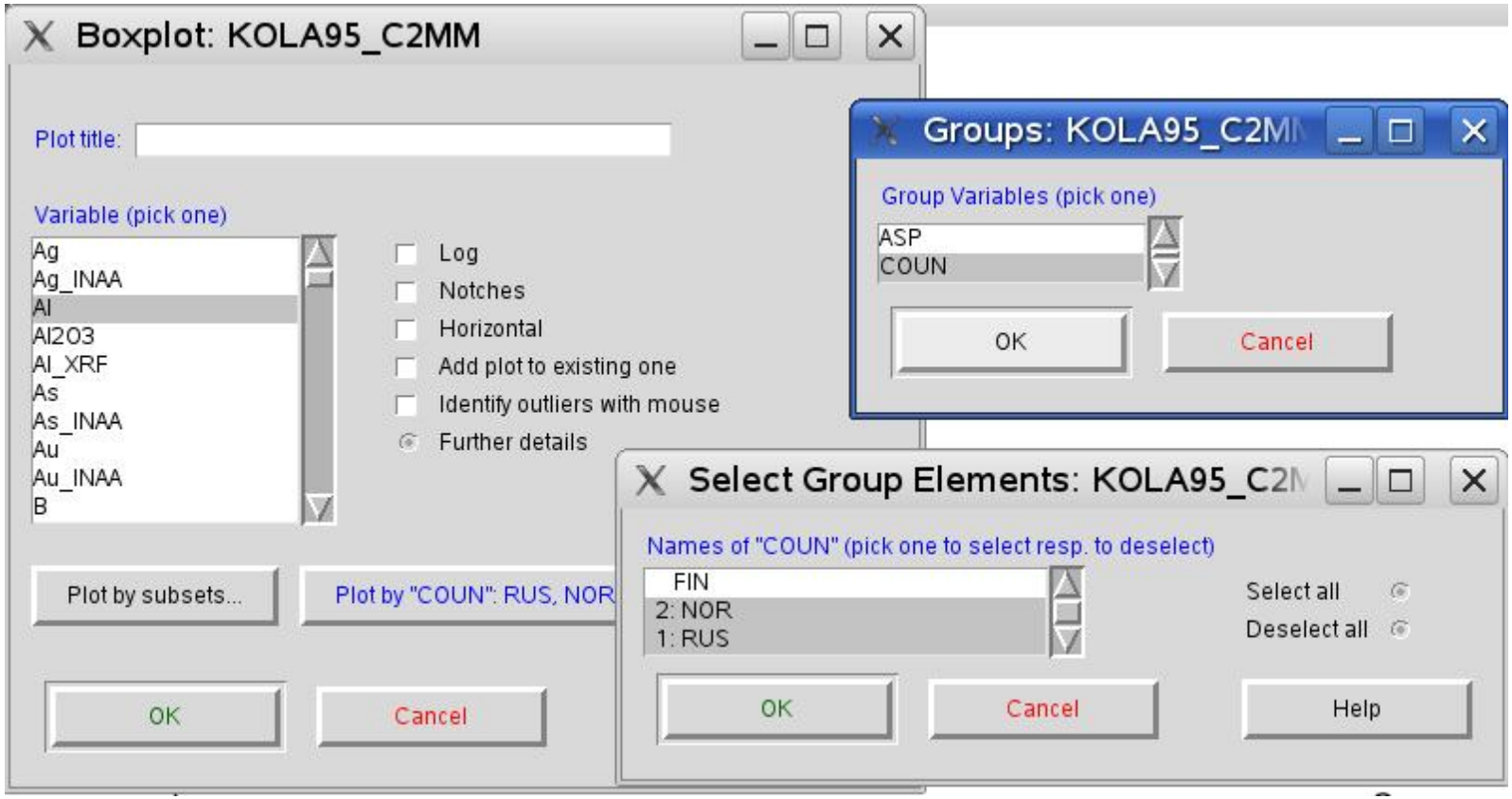
Copy Paste Quit

	ID	XCOO	YCOO	ELEV	COUN	ASP	TOPC	LITO	Ag	Ag_INAA
1	1	547960	7690000	135	FIN	NW	35	20	0.01	2.5
2	2	770025	7680000	140	RUS	SW	52	4	0.01	2.5
3	3	498651	7670000	255	FIN	N	52	31	0.021	2.5
4	4	795152	7570000	240	RUS	NE	40	20	0.022	2.5
5	5	437050	7860000	80	NOR	N	50	10	0.023	2.5
6	6	752106	7630000	140	RUS	E	42	20	0.007	2.5
7	7	531687	7630000	195	FIN	E	34	31	0.027	2.5
8	9	752013	7690000	120	RUS	FLAT	17	4	0.012	2.5
9	10	688999	7610000	90	RUS	FLAT	38	1	0.004	2.5
10	11	489804	7650000	180	FIN	SE	26	31	0.013	2.5
11	12	718237	7620000	180	RUS	NW	25	20	0.009	2.5
12	13	427280	7490000	240	FIN	SW	40	7	0.005	2.5
13	16	597300	7700000	100	NOR	NW	32	52	0.007	2.5
14	17	667085	7680000	170	RUS	FLAT	31	21	0.015	2.5
15	18	594611	7550000	280	FIN	N	42	1	0.008	2.5
16	19	514744	7580000	280	FIN	S	30	31	0.009	2.5
17	20	710133	7570000	210	RUS	SE	35	1	0.007	2.5
18	21	439900	7650000	280	NOR	W	23	1	0.005	2.5
19	22	734135	7670000	100	RUS	FLAT	44	21	0.012	2.5
20	23	787098	7500000	140	RUS	FLAT	45	1	0.007	2.5
21	24	624400	7540000	160	RUS	FLAT	41	51	0.008	2.5
22	25	627700	7480000	280	RUS	FLAT	NA	1	0.007	2.5
23	26	386646	7540000	300	FIN	S	36	1	0.004	2.5
24	27	713892	7740000	160	RUS	SW	30	9	0.01	2.5
25	28	579500	7650000	110	RUS	FLAT	32	20	0.011	2.5

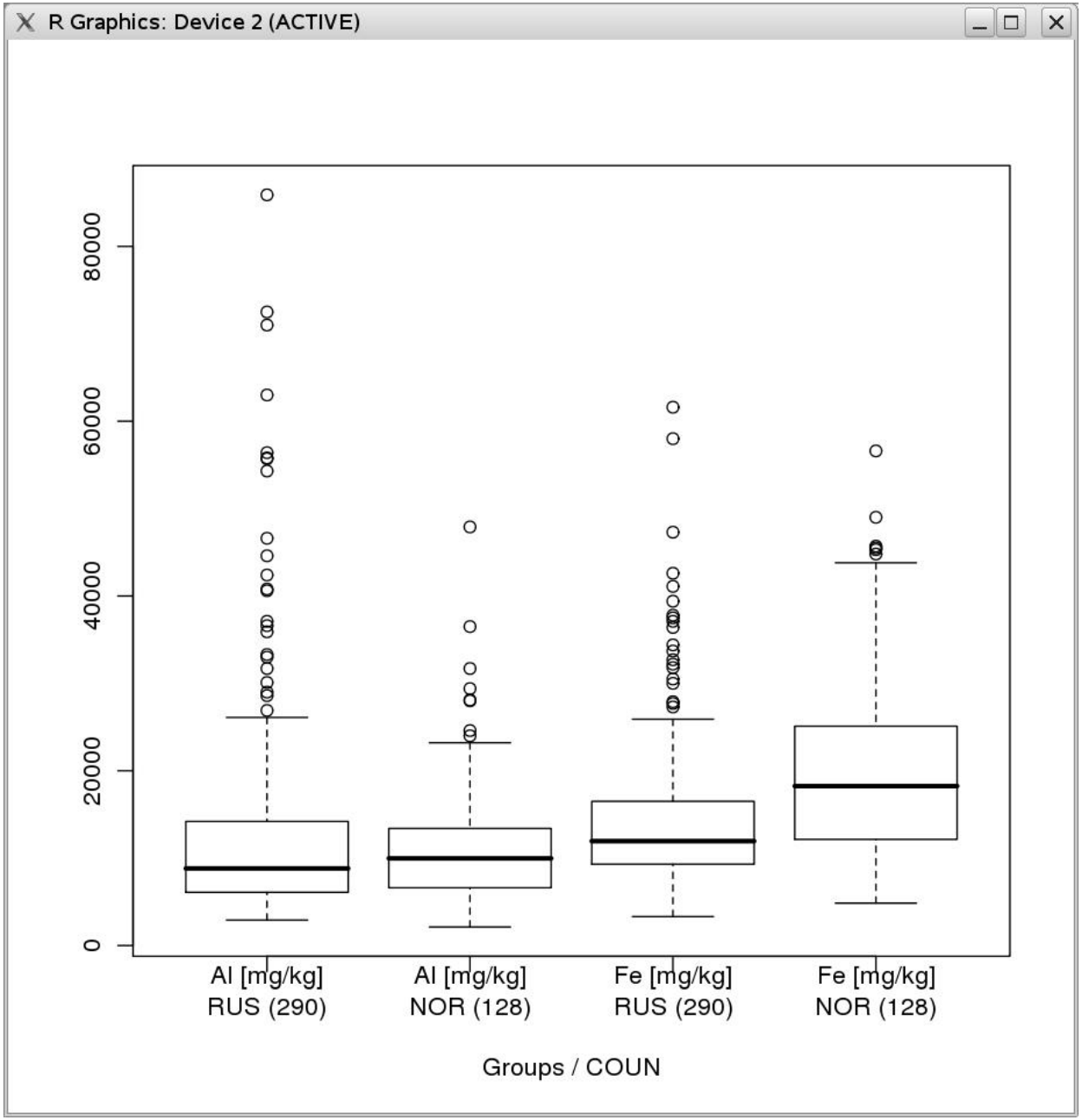
Histogram


DAS+R(0.0-2)
File Edit Select Statistics Worksheet Diagrams Maps Text & Symbol Advanced Tools Windows Help
Data set: KOLA95_C2MM
Model: <No active model>
Histogram
Density
Cdf
Boxplot
Xyplot
Ternary Plot
Draftman
Smooth
Save Graph to File
Script Window
activeDataSet("KOLA95_
importDASImpData("/hon
ING/2004-05/proj_prak_05
Submit
Output Window
> activeDataSet("KOLA95_Chor")
> importDASImpData("/home/dutt/TEA
Messages
NOTE: The dataset KOLA95_C2MM has
R Graphics: Device 2 (ACTIVE)
Histogram of KOLA95_Chor$Al
Frequency
0
100
200
300

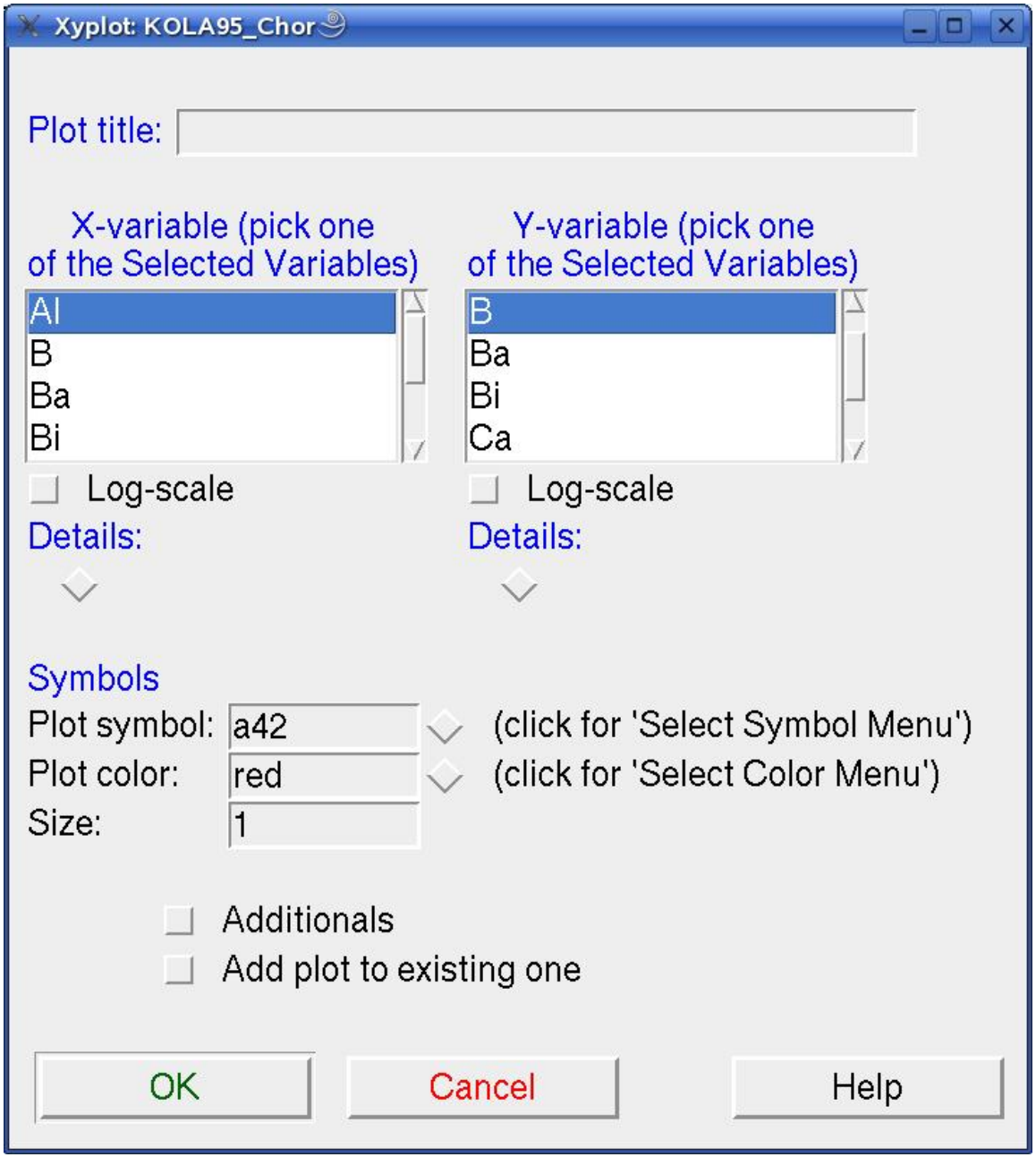
Boxplots


Boxplot: KOLA95_C2MM
Plot title:
Variable (pick one)
Ag
Ag_INAA
Al
Al2O3
Al_XRF
As
As_INAA
Au
Au_INAA
B
Log
Notches
Horizontal
Add plot to existing one
Identify outliers with mouse
Further details
Plot by subsets...
Plot by "COUN": RUS, NOR
OK
Cancel
Groups: KOLA95_C2MM
Group Variables (pick one)
ASP
COUN
OK
Cancel
Select Group Elements: KOLA95_C2M
Names of "COUN" (pick one to select resp. to deselect)
FIN
2: NOR
1: RUS
Select all
Deselect all
OK
Cancel
Help

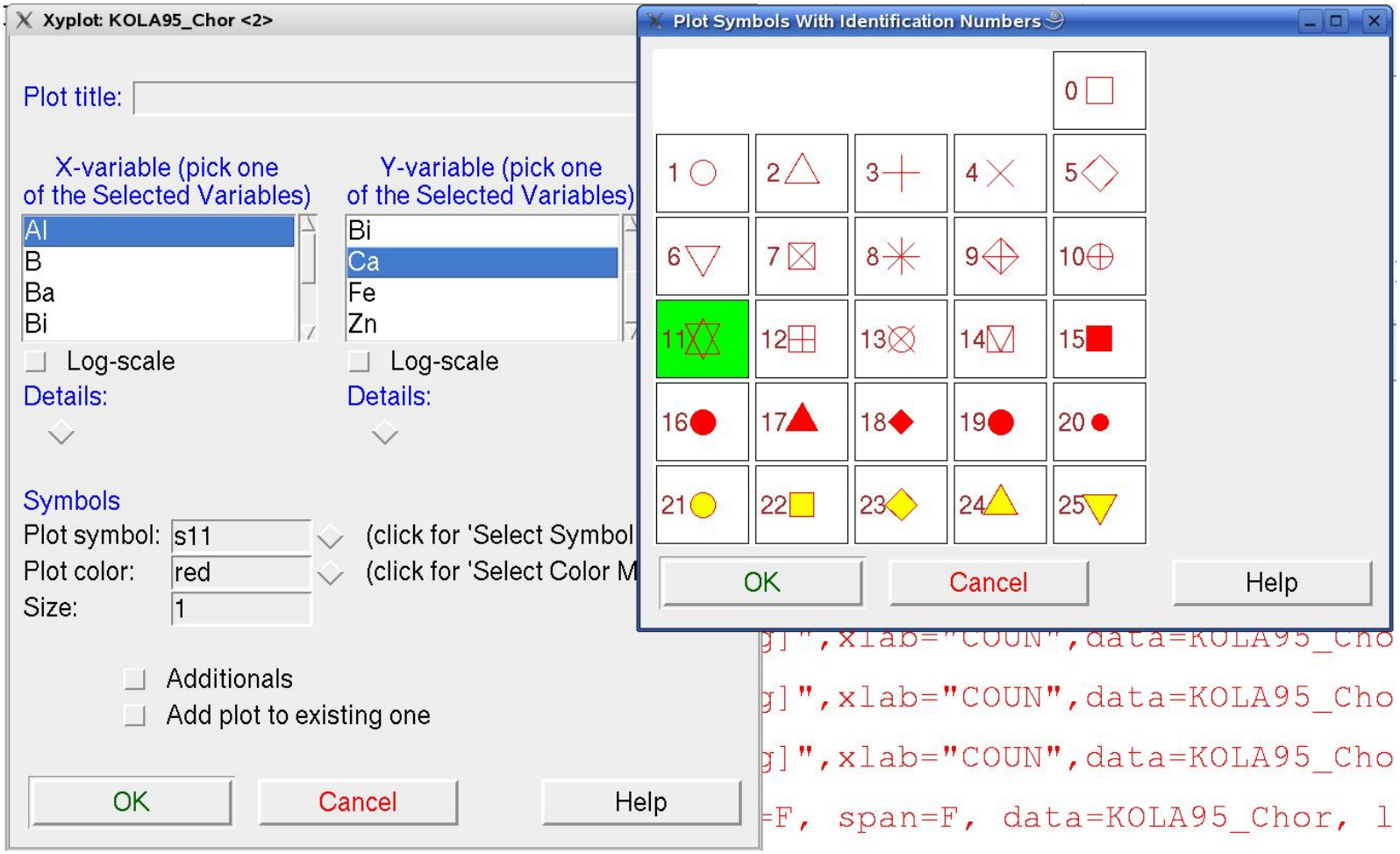
Boxplots


R Graphics: Device 2 (ACTIVE)
0
20000
40000
60000
80000
Al [mg/kg]
RUS (290)
Al [mg/kg]
NOR (128)
Fe [mg/kg]
RUS (290)
Fe [mg/kg]
NOR (128)
Groups / COUN

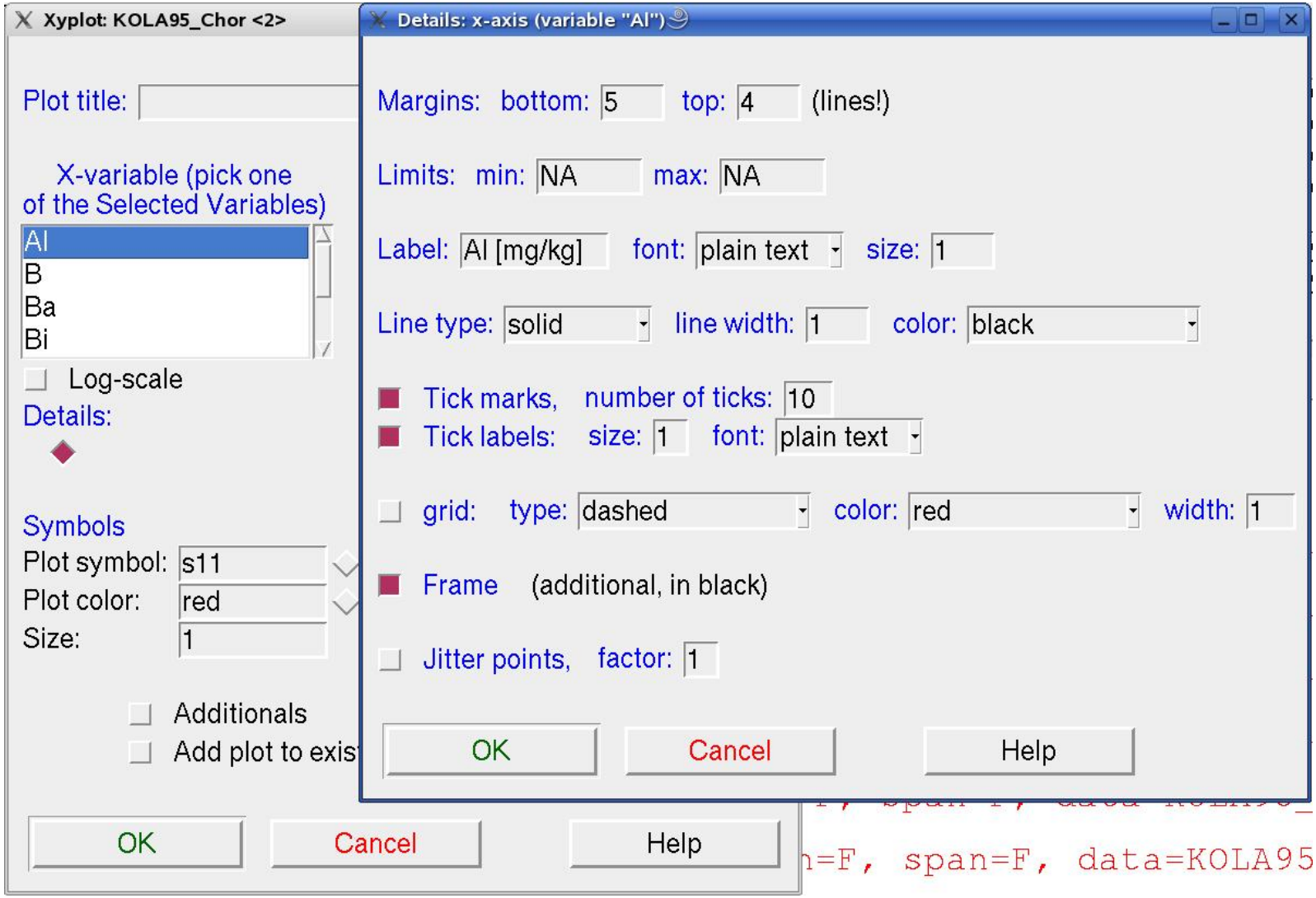
Xyplot: Specifications



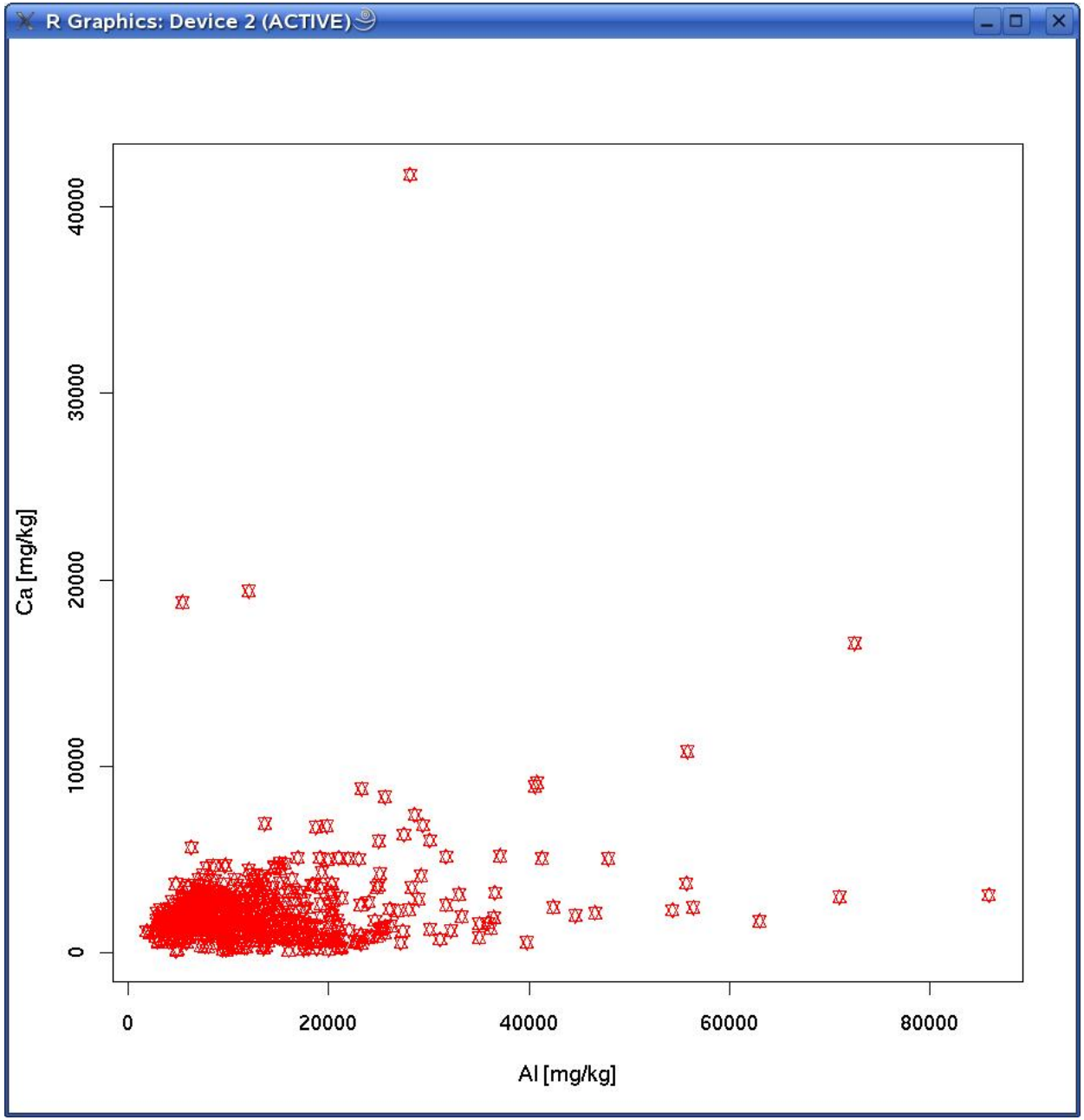
Xyplot: Specifications



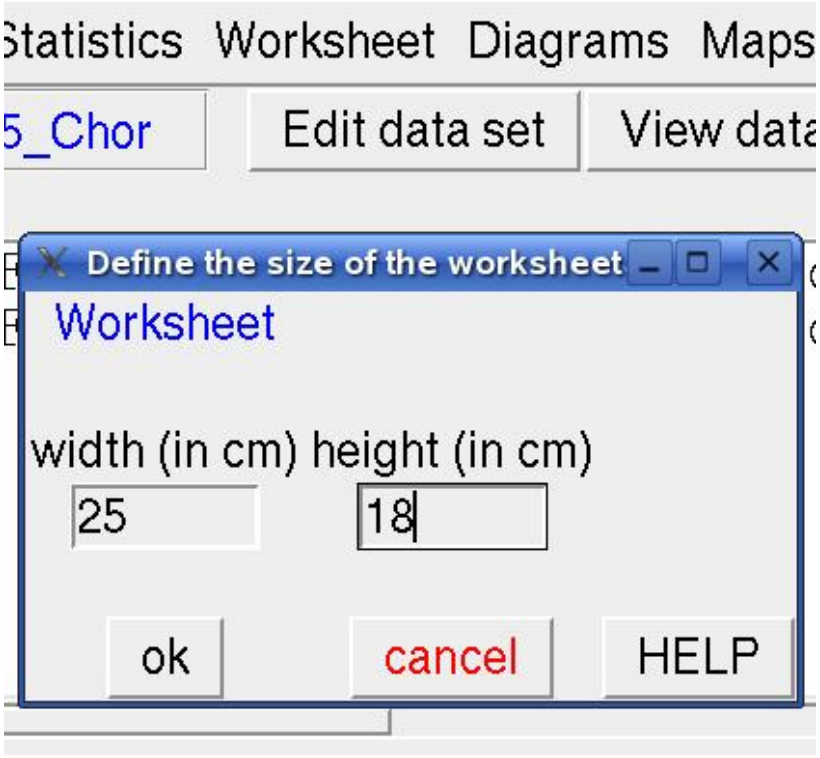
Xyplot: Specifications



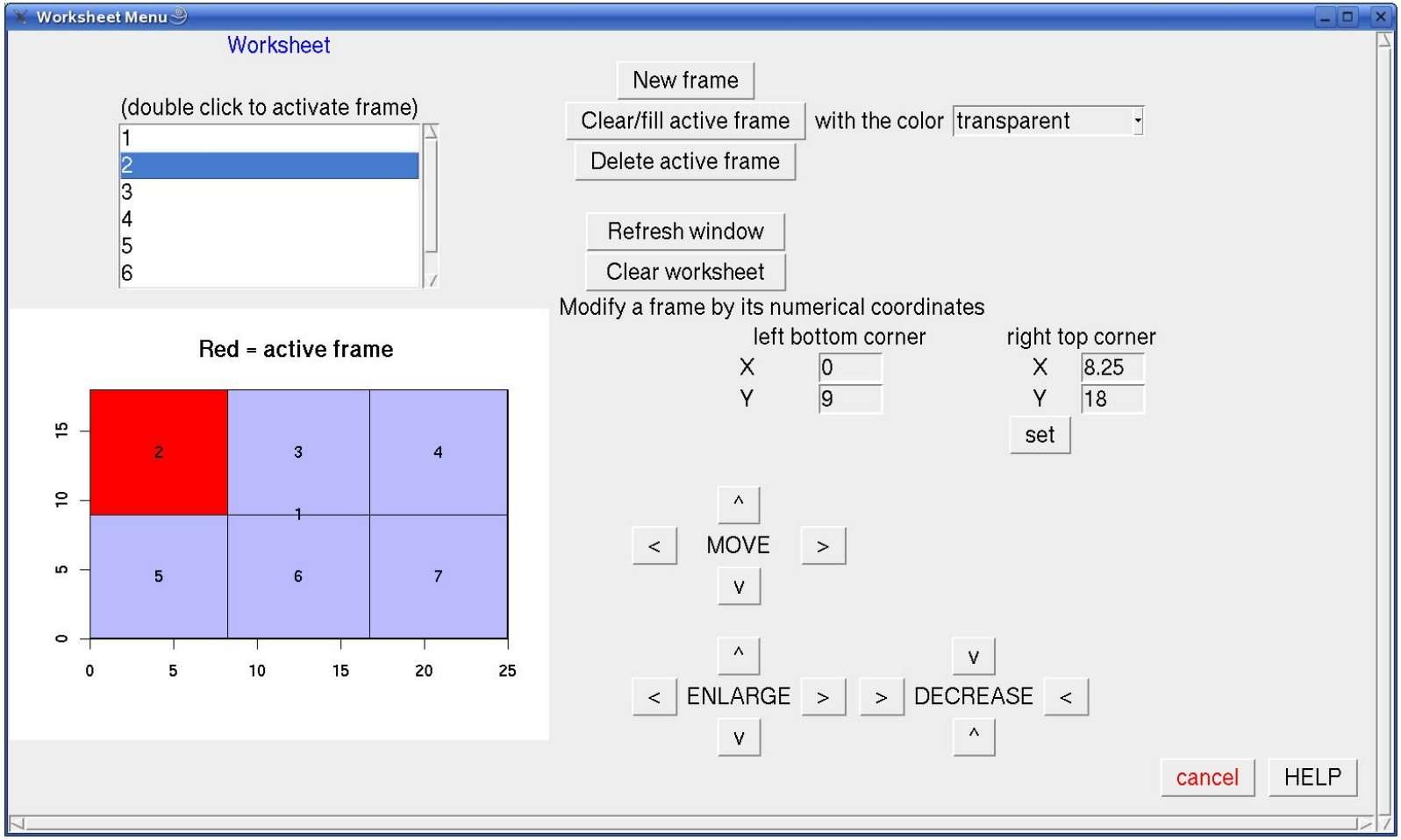
Xyplot


R Graphics: Device 2 (ACTIVE)
Ca [mg/kg]
0
10000
20000
30000
40000
0
20000
40000
60000
80000
Al [mg/kg]

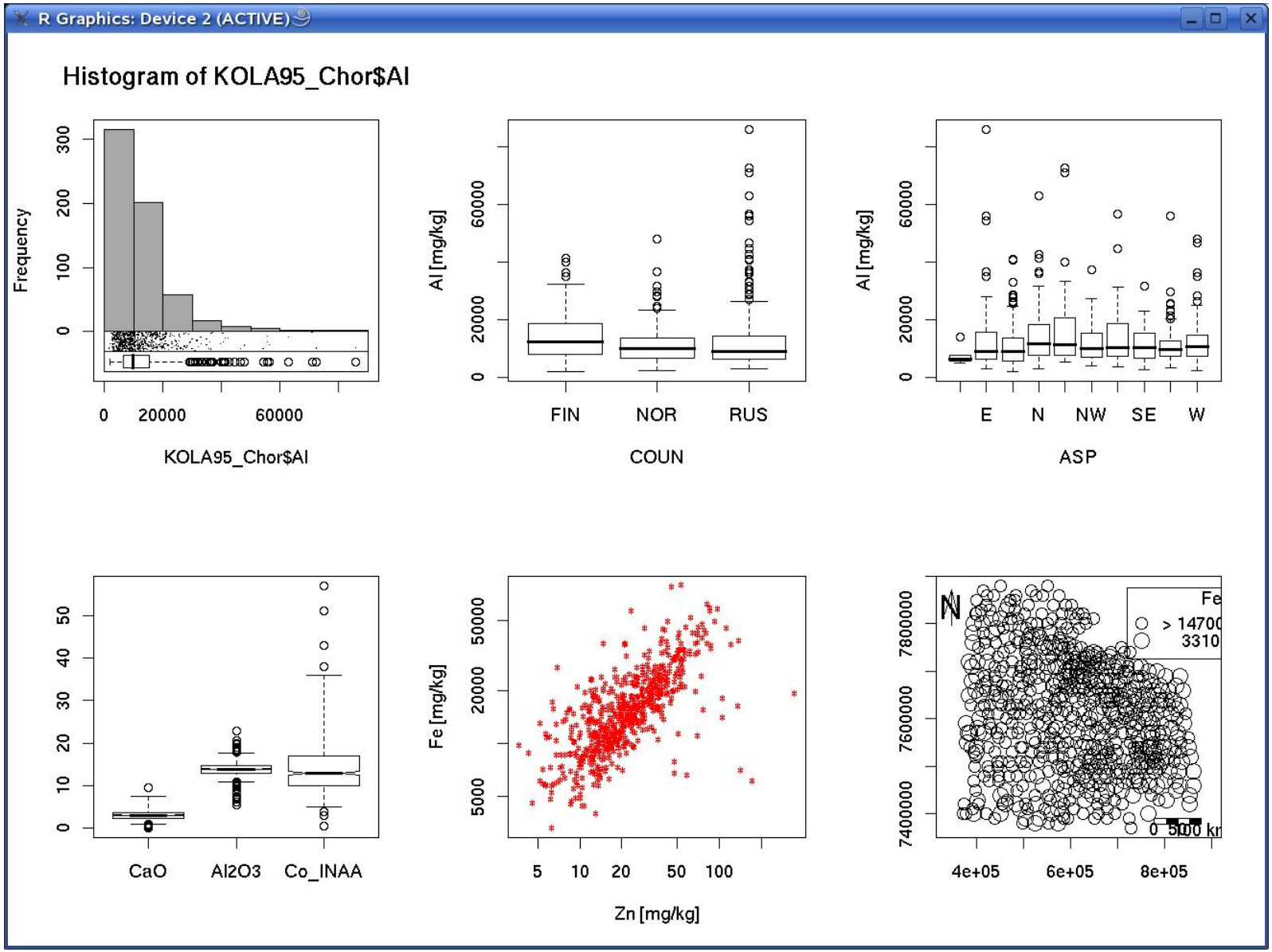
Worksheet


Statistics Worksheet Diagrams Maps
5_Chor
Edit data set
View data
Define the size of the worksheet
Worksheet
width (in cm) height (in cm)
25
18
ok
cancel
HELP

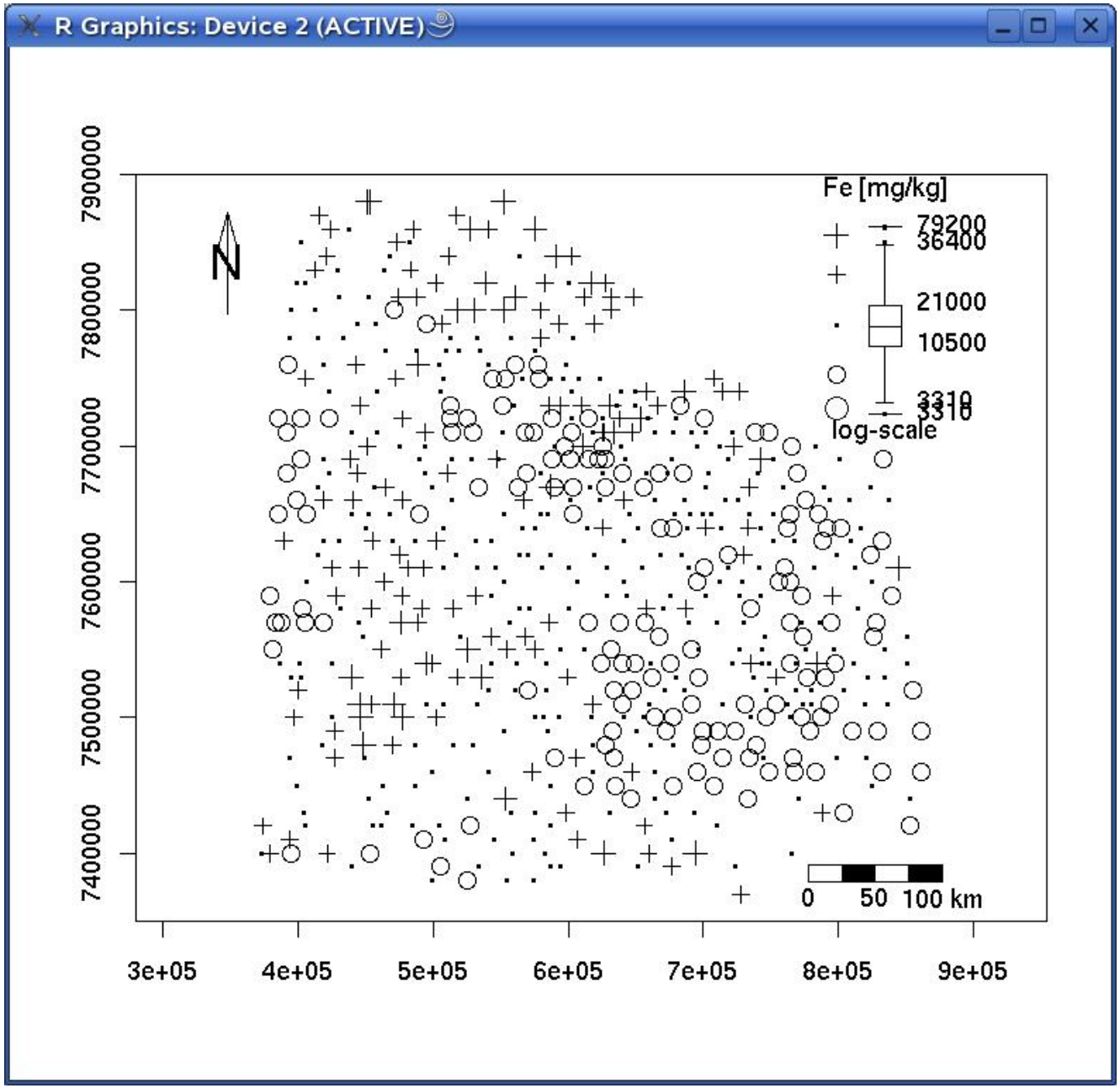
Worksheet Menu



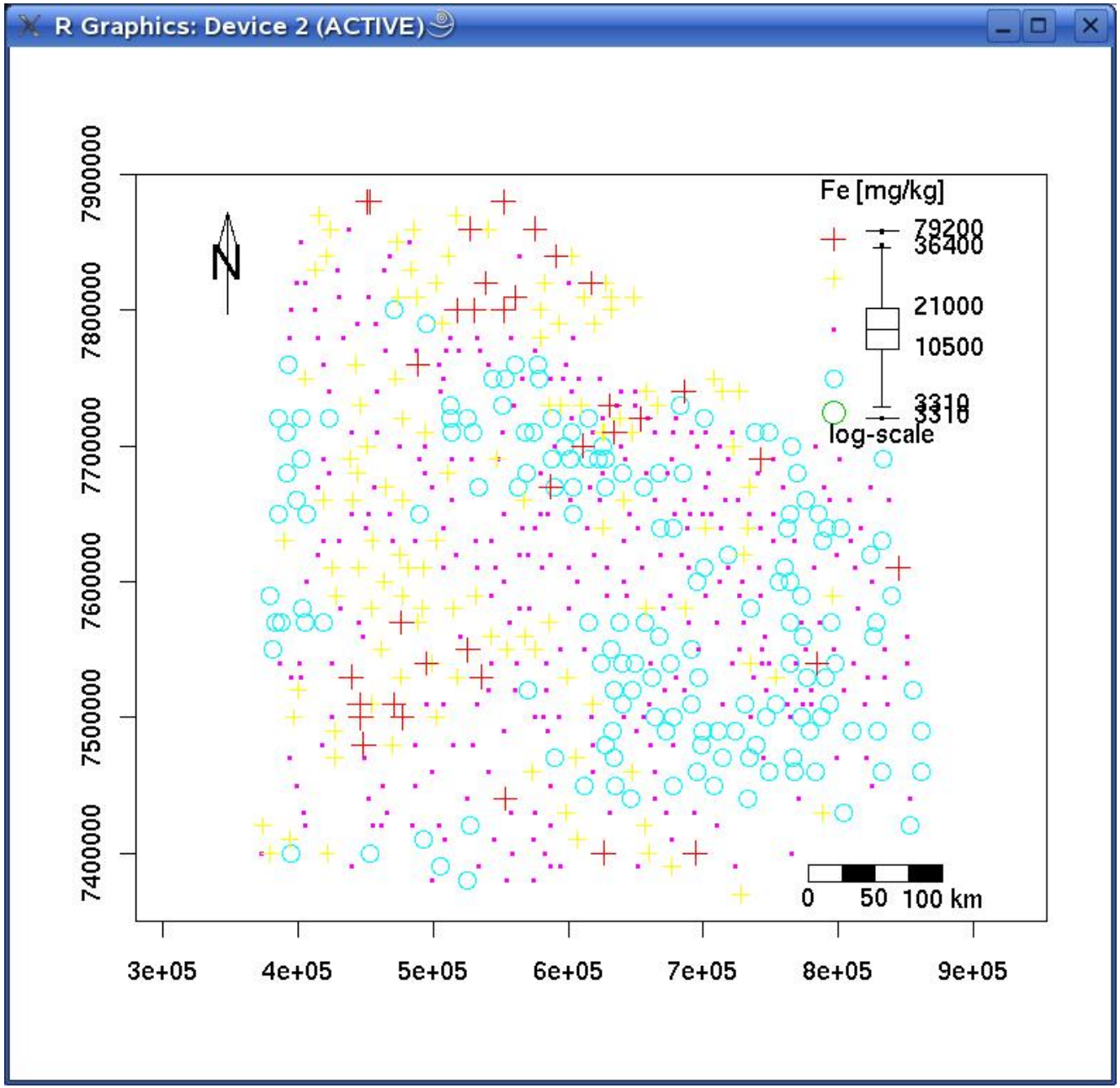
Filled Worksheet



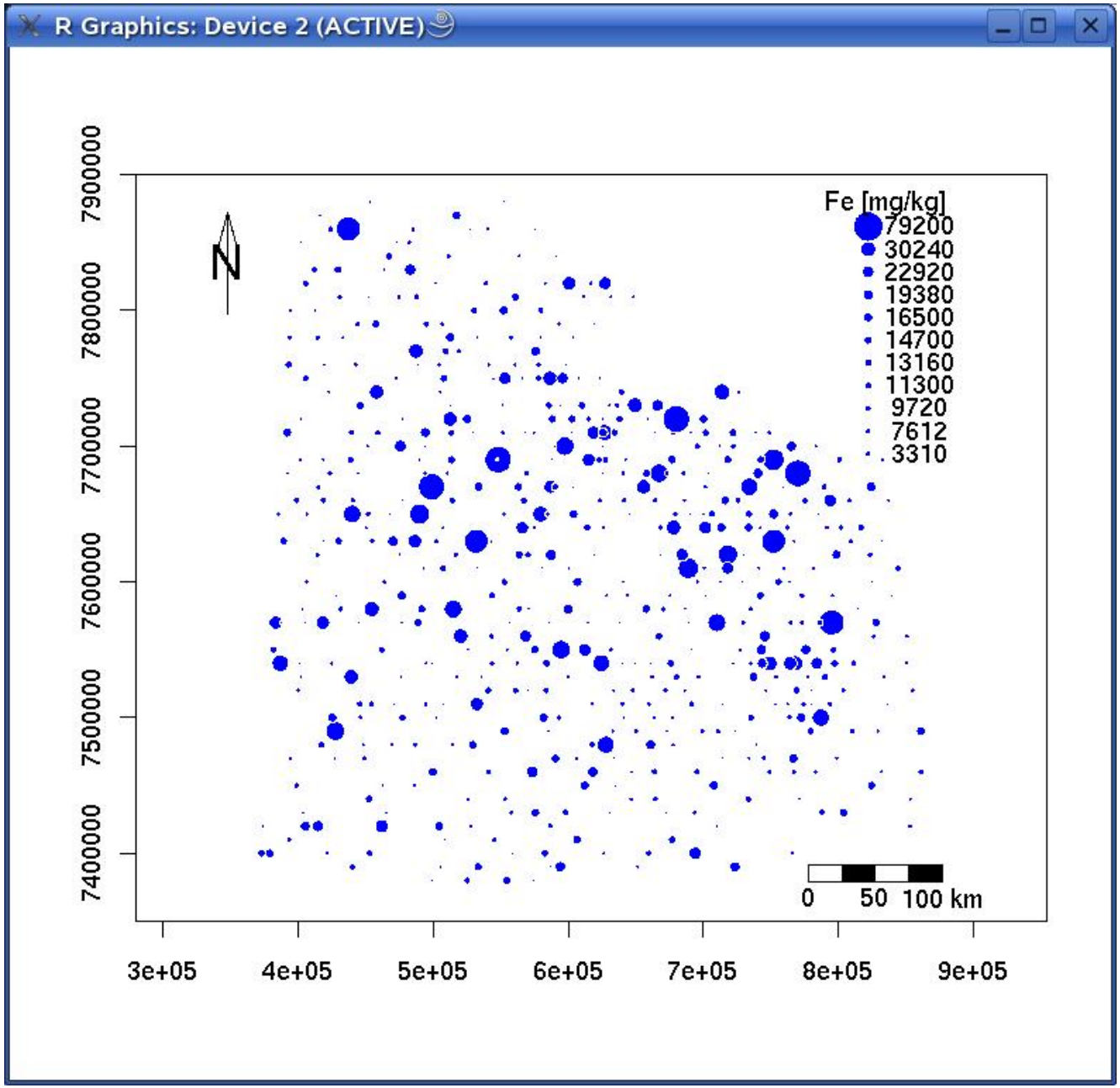
Mapping: Boxplot



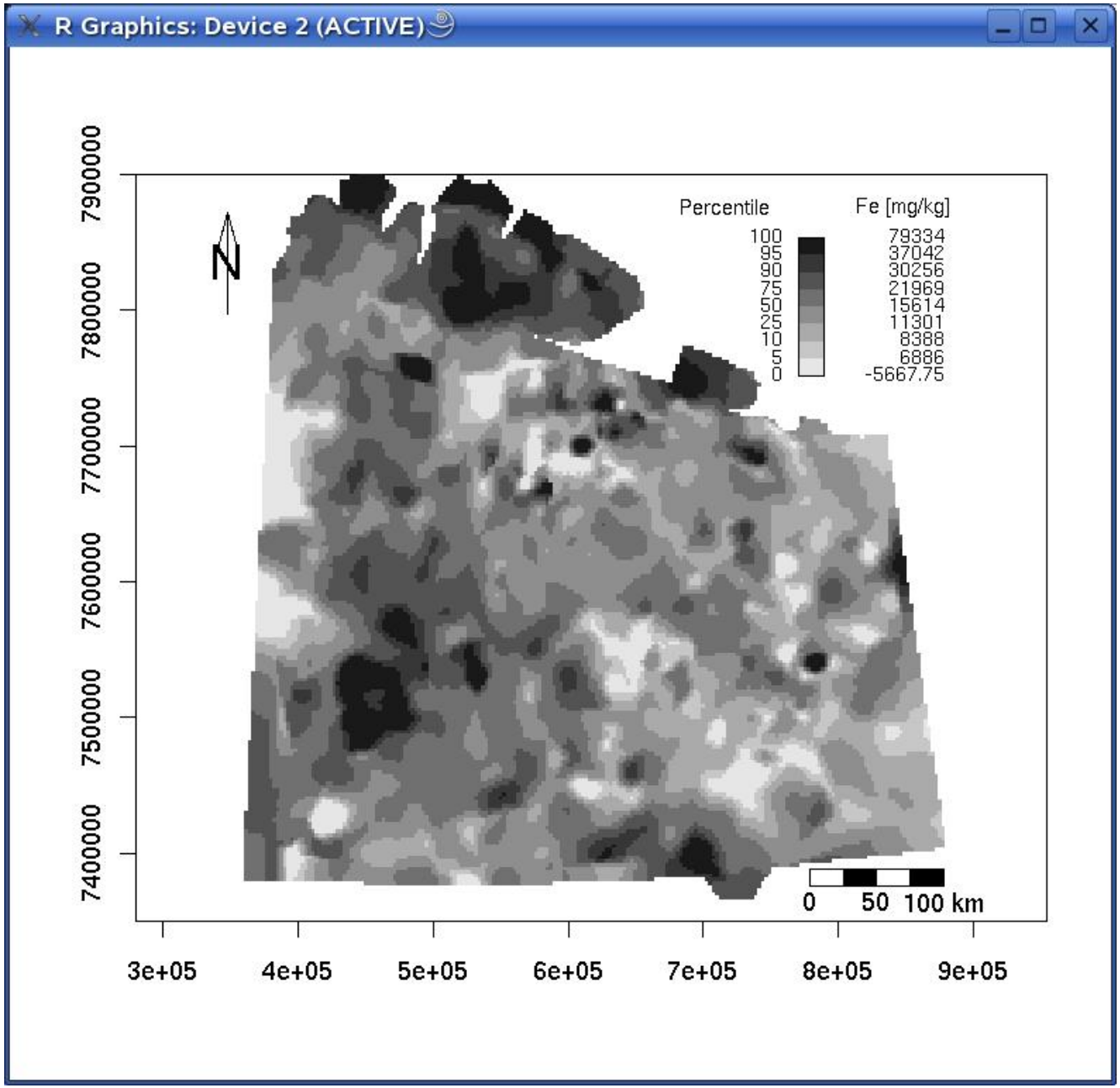
Mapping: Boxplot



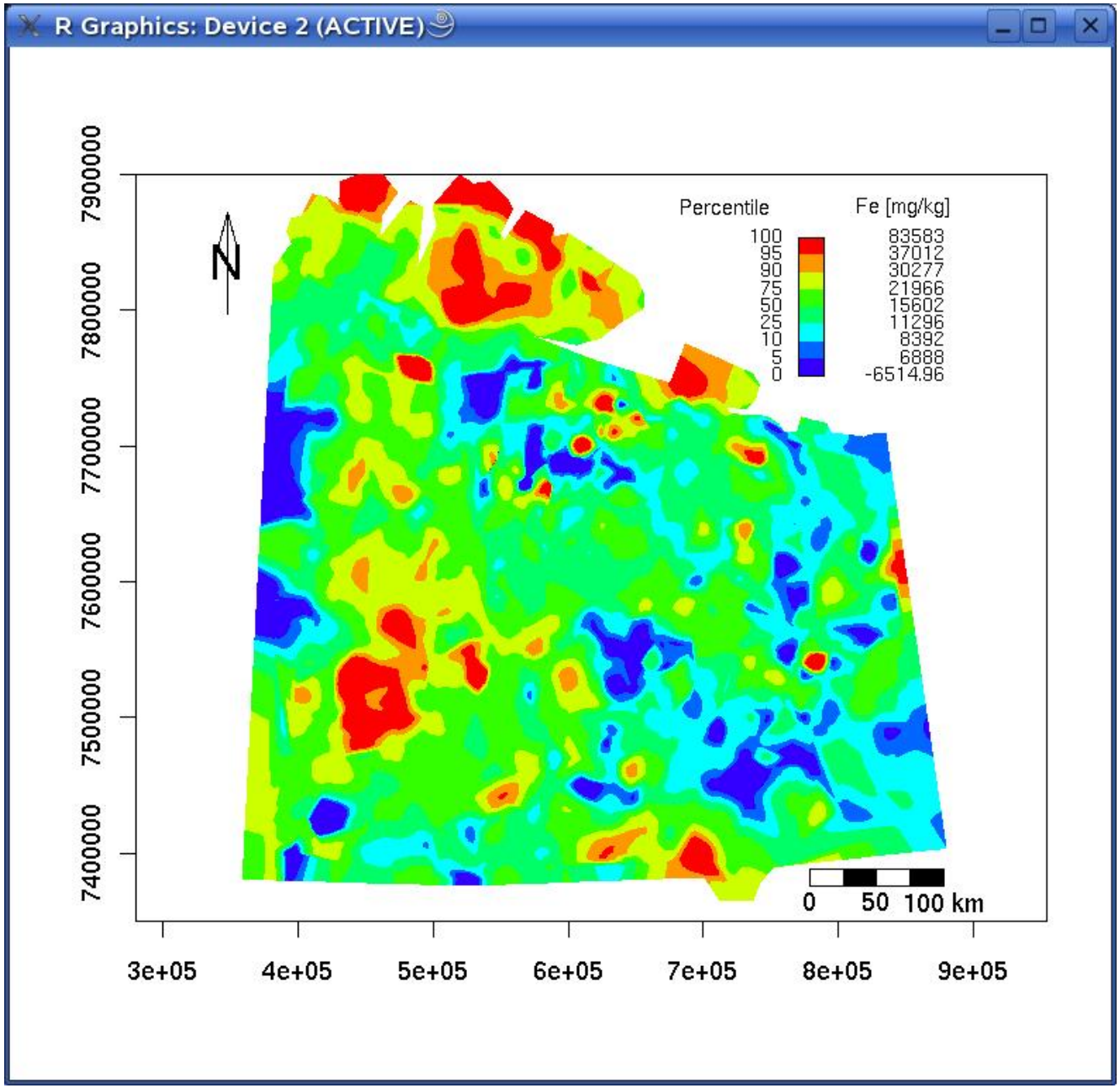
Mapping: Proportional Plot



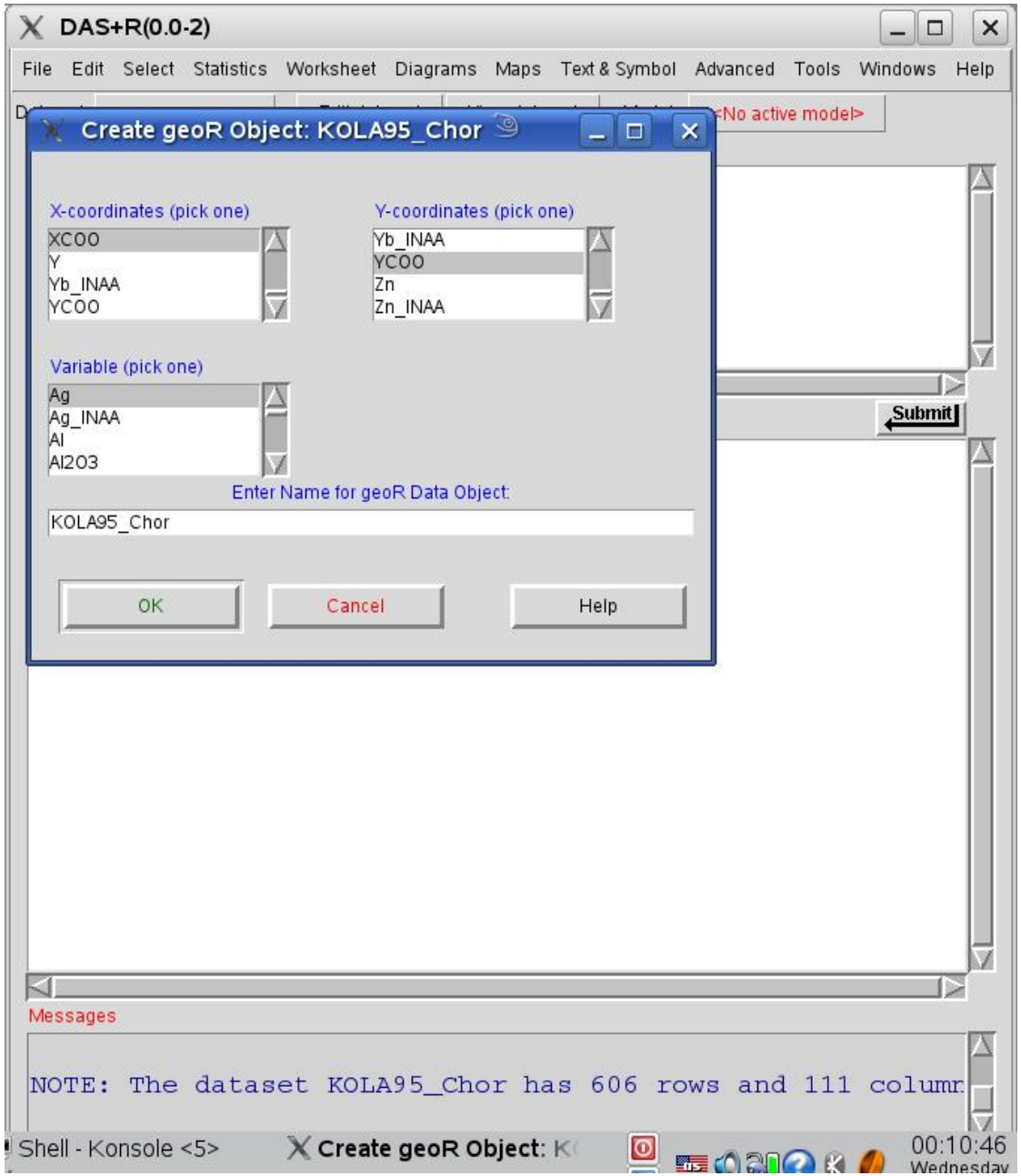
Mapping: Simple Smoothing



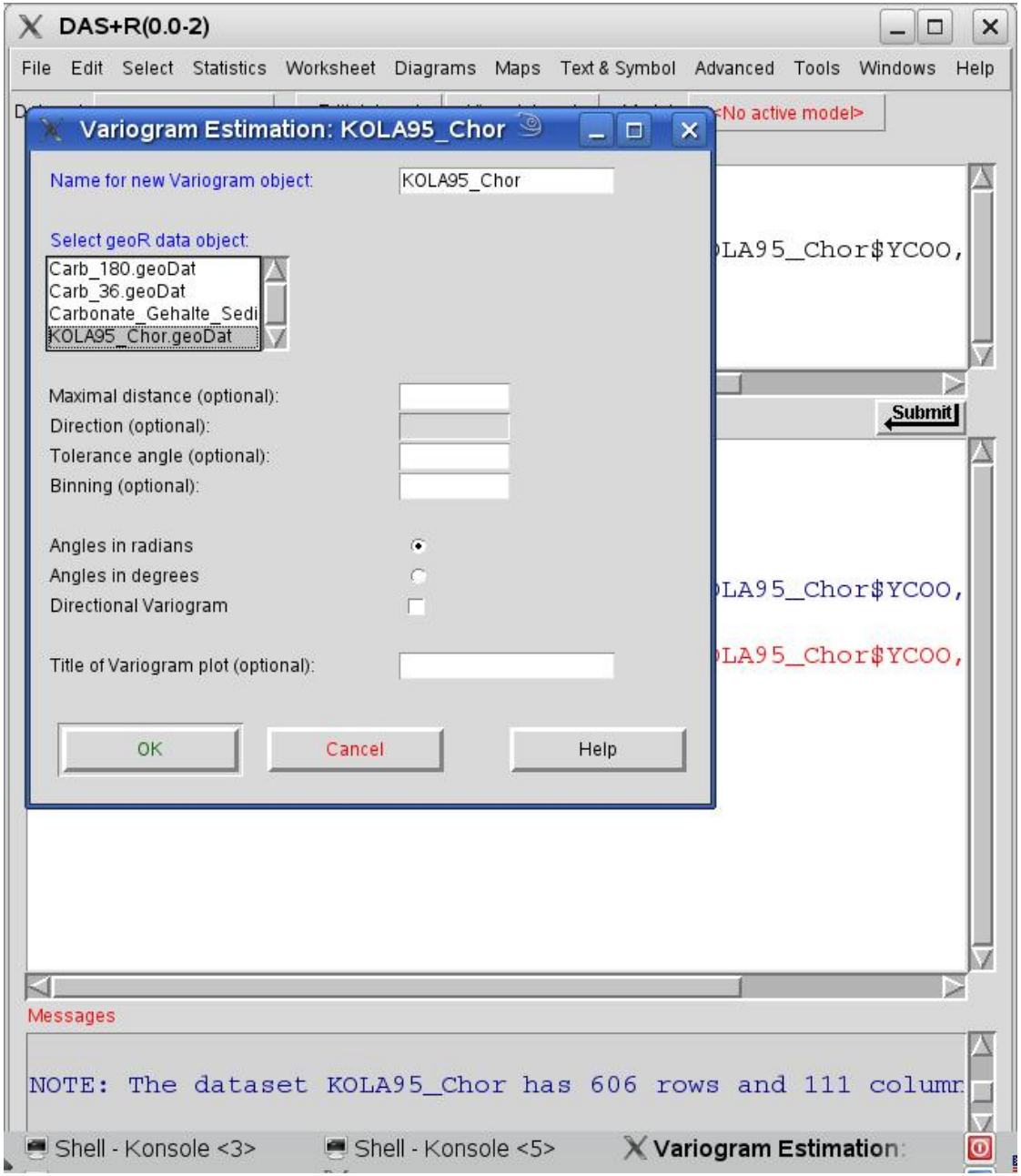
Mapping: Simple Smoothing



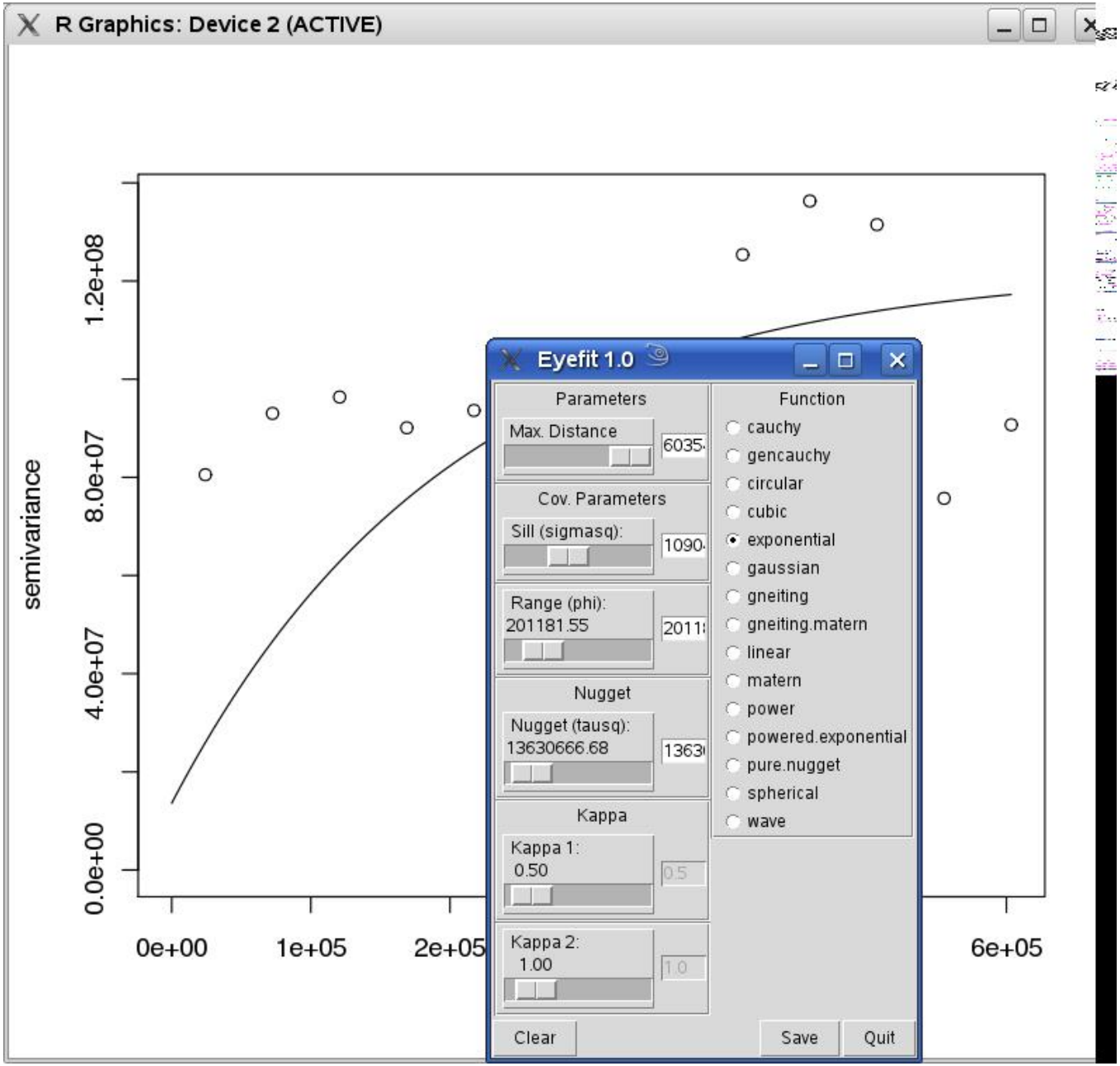
Mapping: Kriging



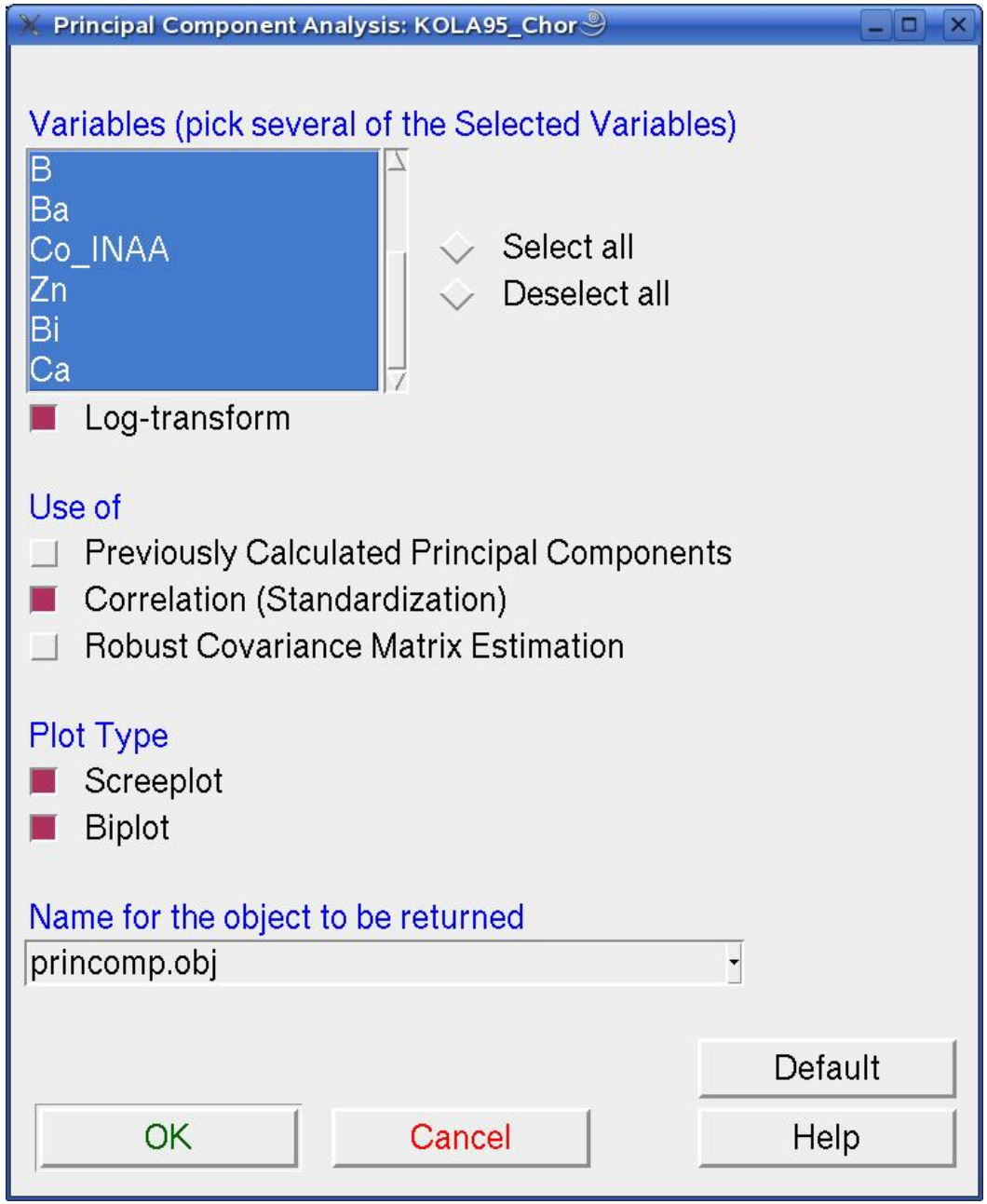
Mapping: Kriging



Mapping: Kriging



Principal Components



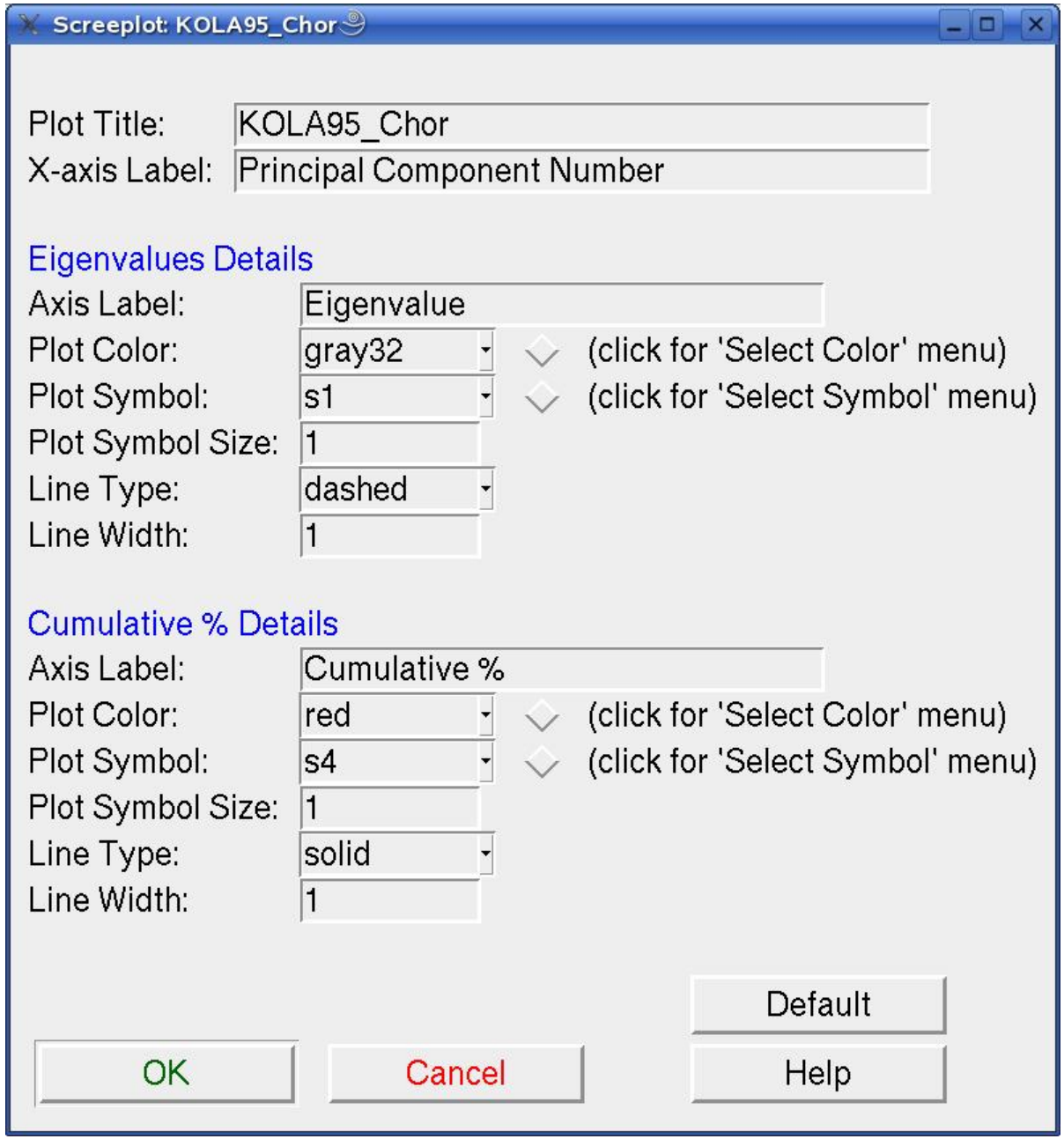
Principal Components

Output Window

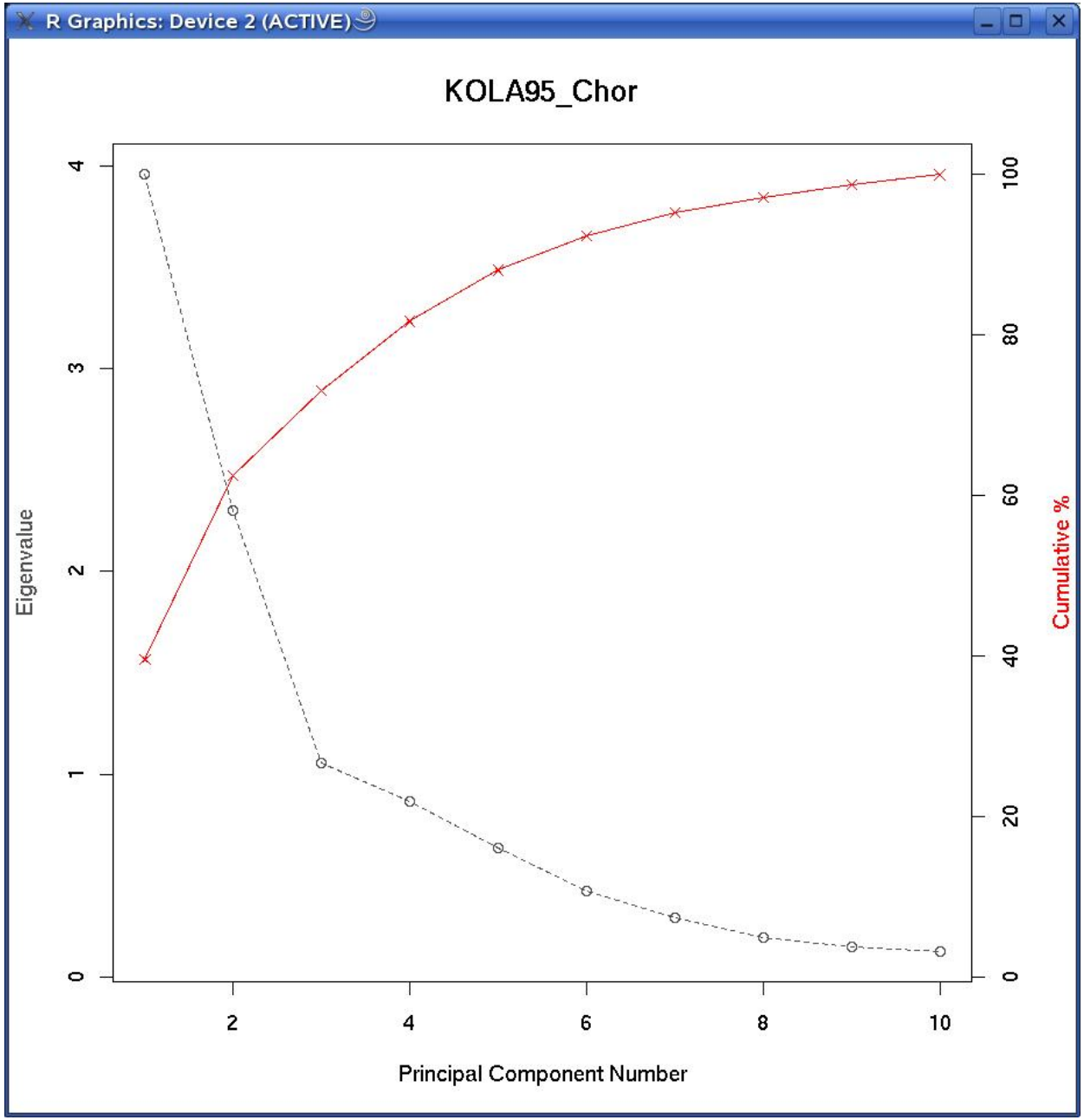
Submit

```
> princomp.obj <- princompDAS(data=KOLA95_Chor, vars=c("Al","CaO","Fe","Al2O3","
> summary(princomp.obj)
Importance of components:
                            PC1       PC2       PC3       PC4        PC5
Standard deviation     1.9886845 1.5158522 1.0274942 0.9298833 0.79809531
Proportion of Variance 0.3954866 0.2297808 0.1055744 0.0864683 0.06369561
Cumulative Proportion  0.3954866 0.6252674 0.7308418 0.8173101 0.88100572
                            PC6        PC7        PC8        PC9       PC10
Standard deviation     0.65051344 0.53951065 0.44207959 0.38933541 0.35872949
Proportion of Variance 0.04231677 0.02910717 0.01954344 0.01515821 0.01286868
Cumulative Proportion  0.92332250 0.95242967 0.97197311 0.98713132 1.00000000
```

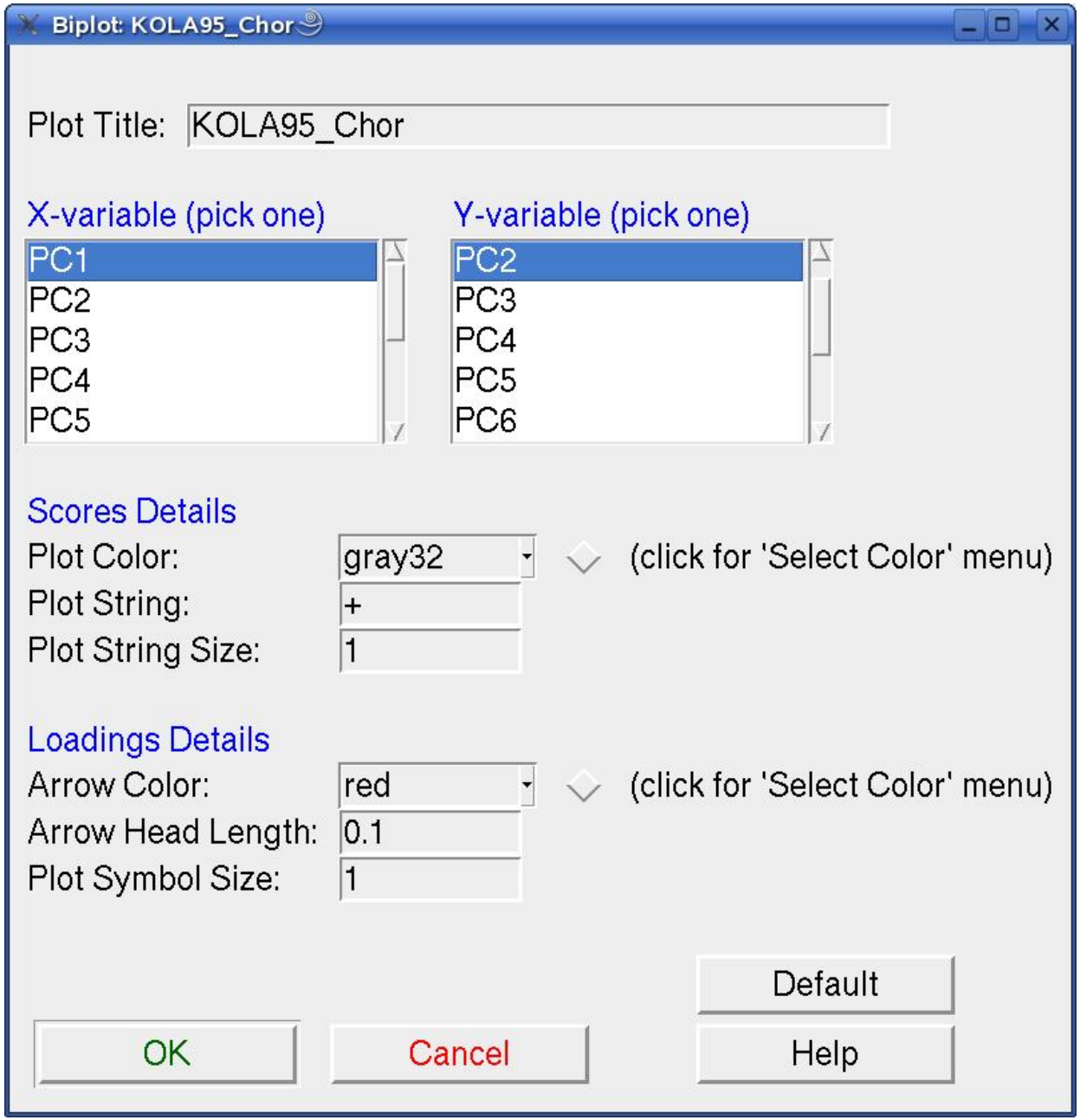
Principal Components



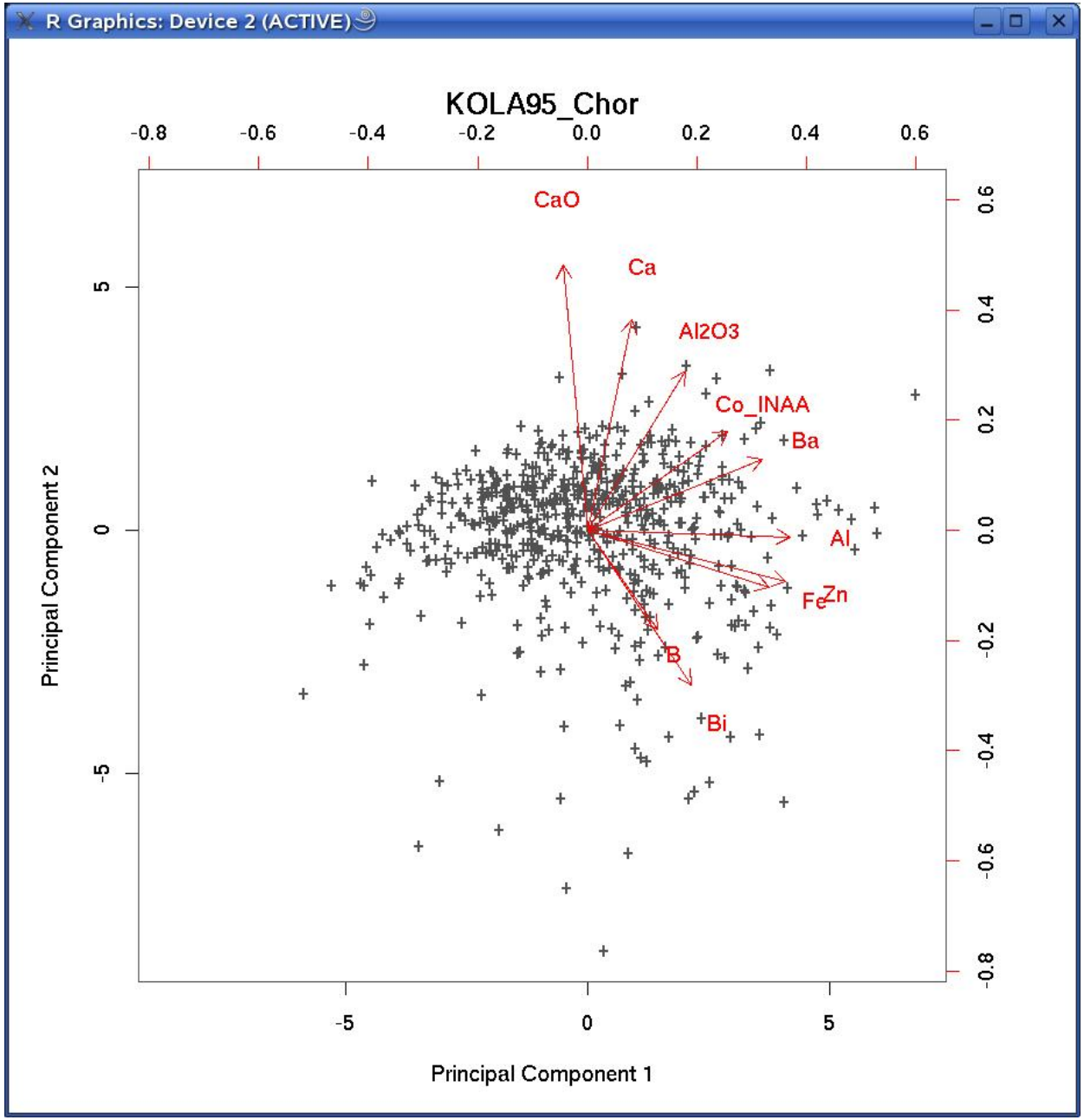
Principal Components



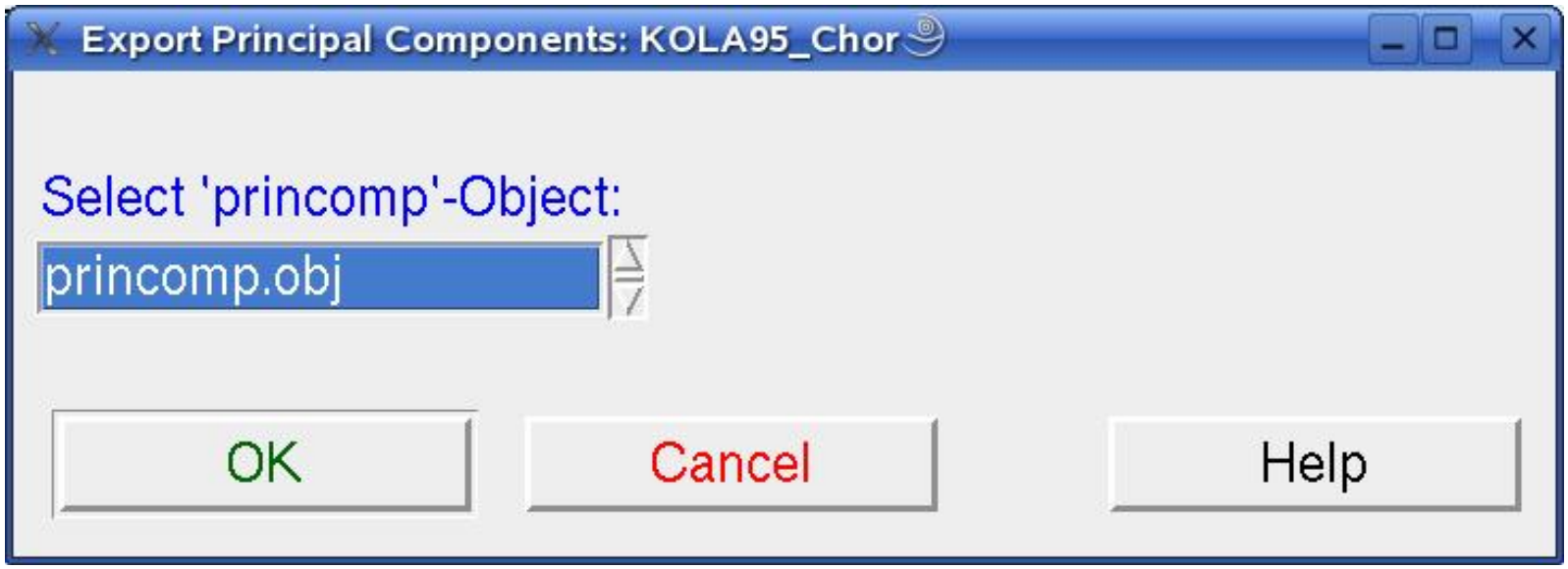
Principal Components



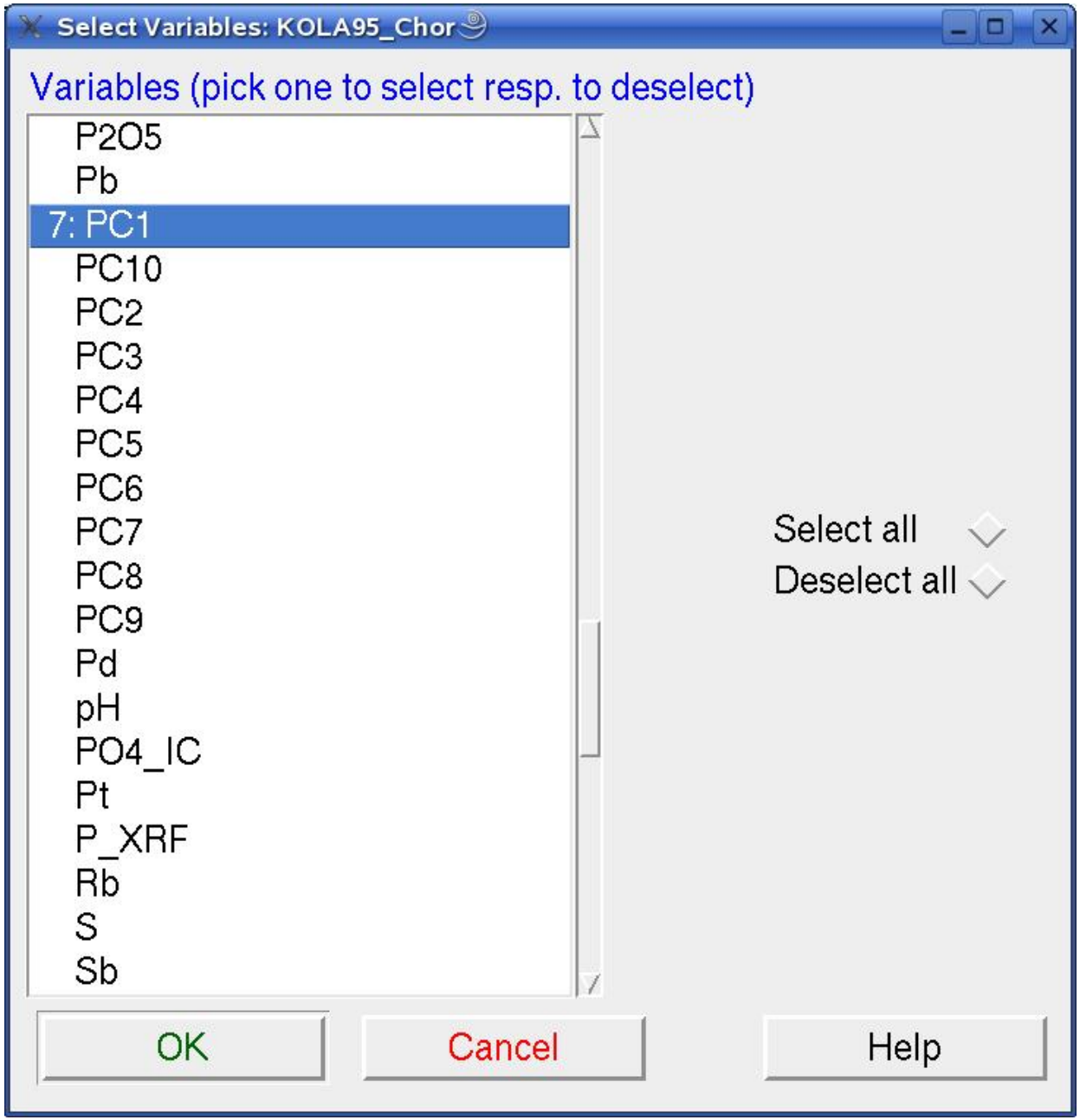
Principal Components



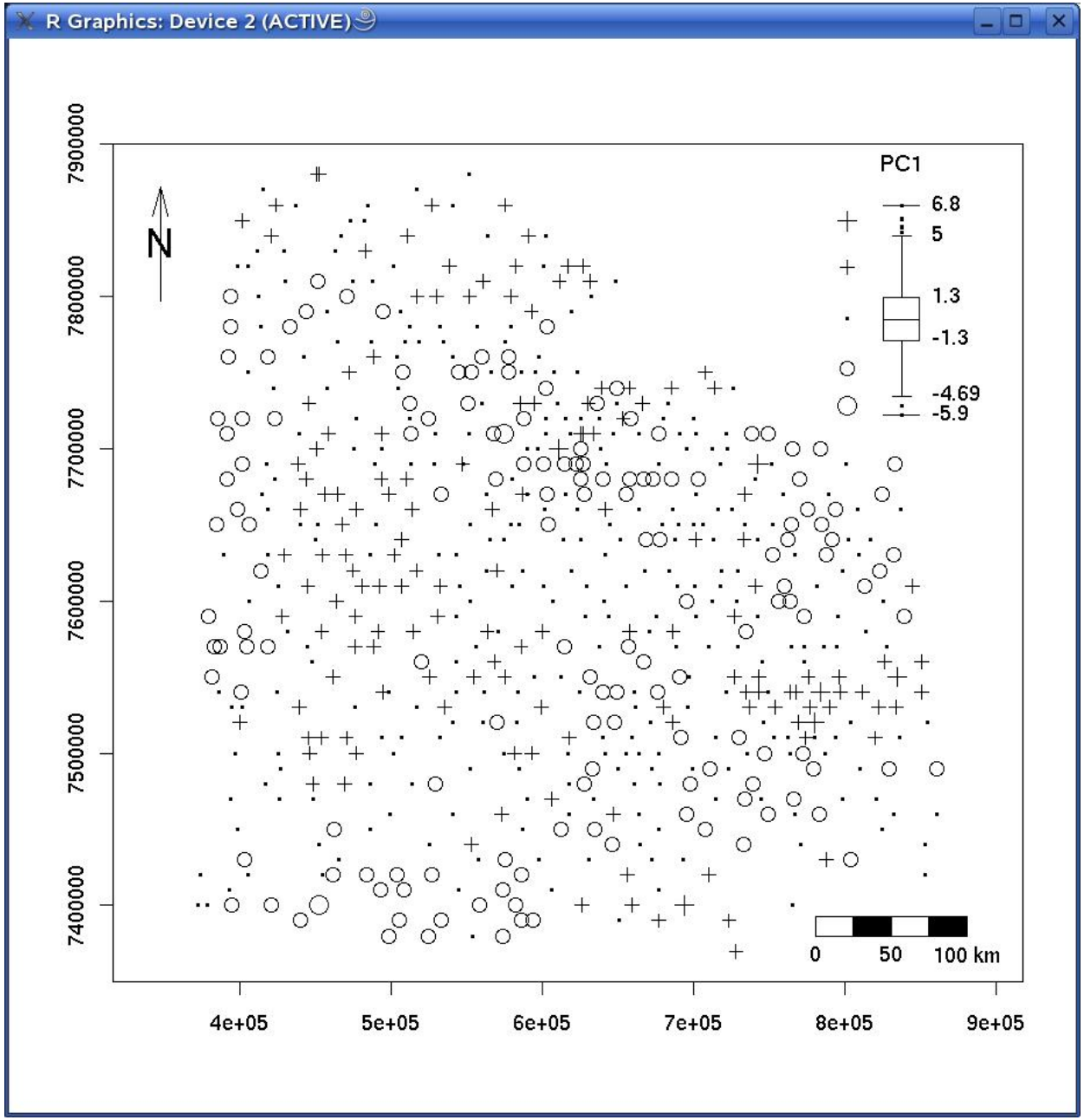
Principal Components: Export



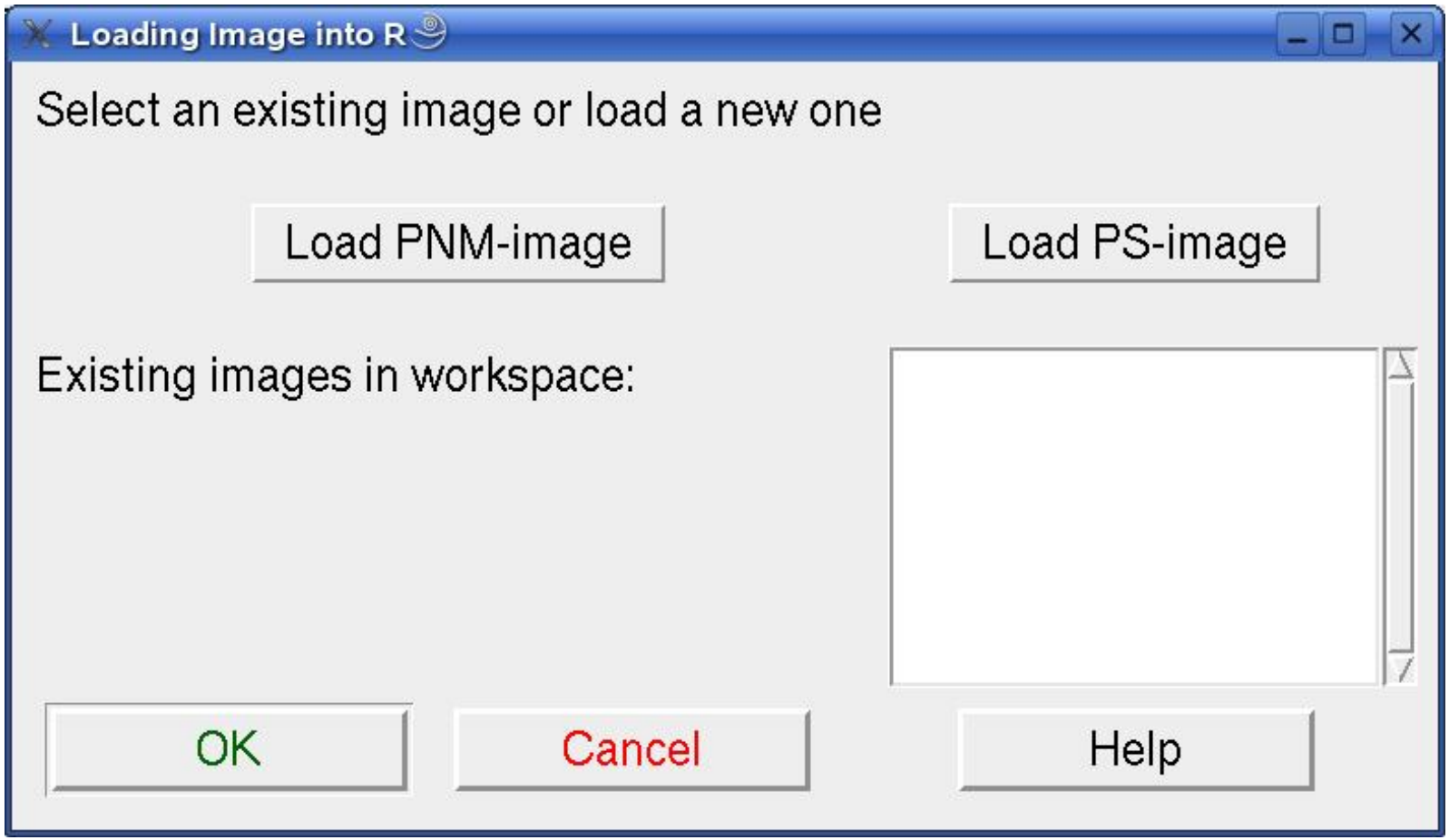
Principal Components: Mapping



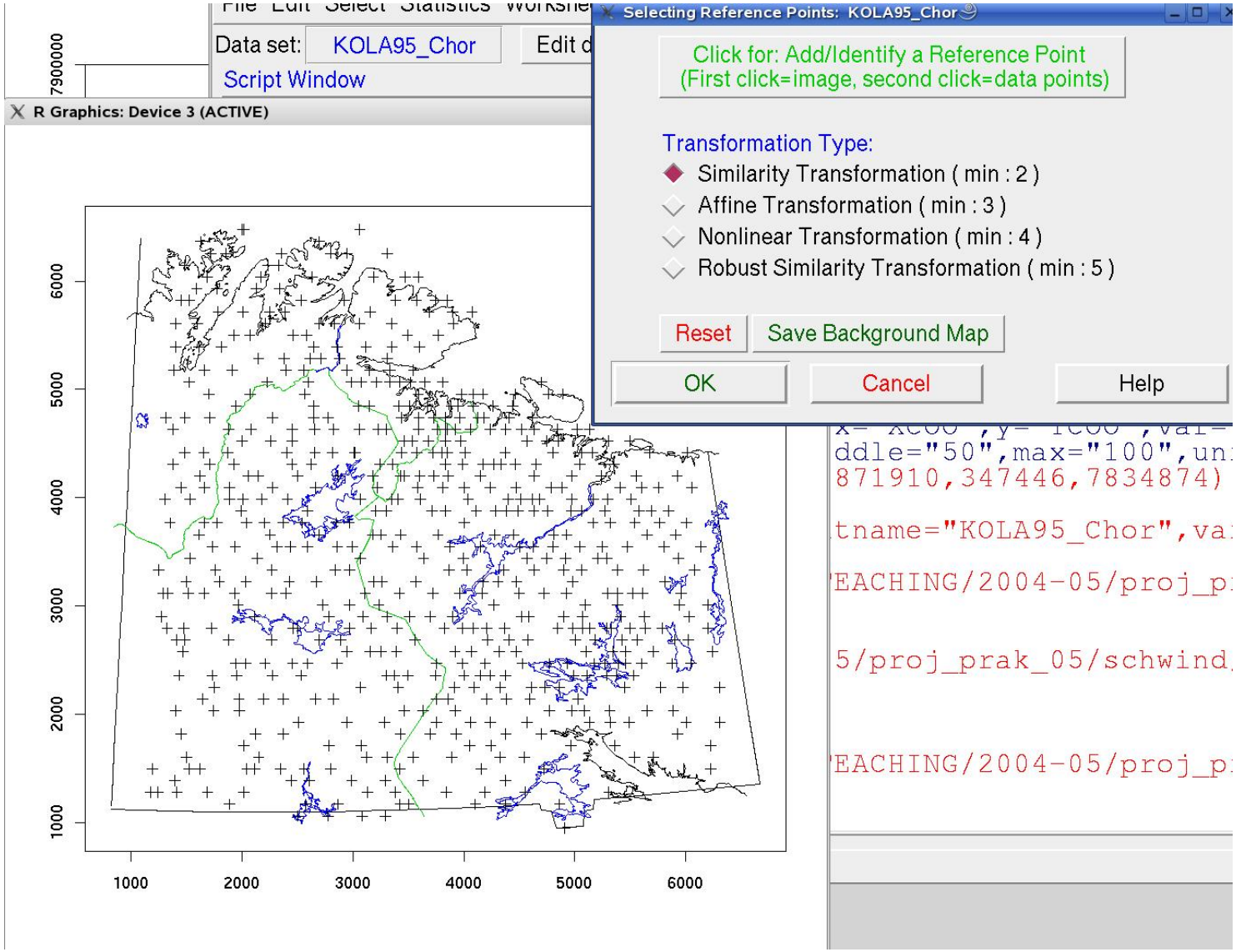
Principal Components: Mapping



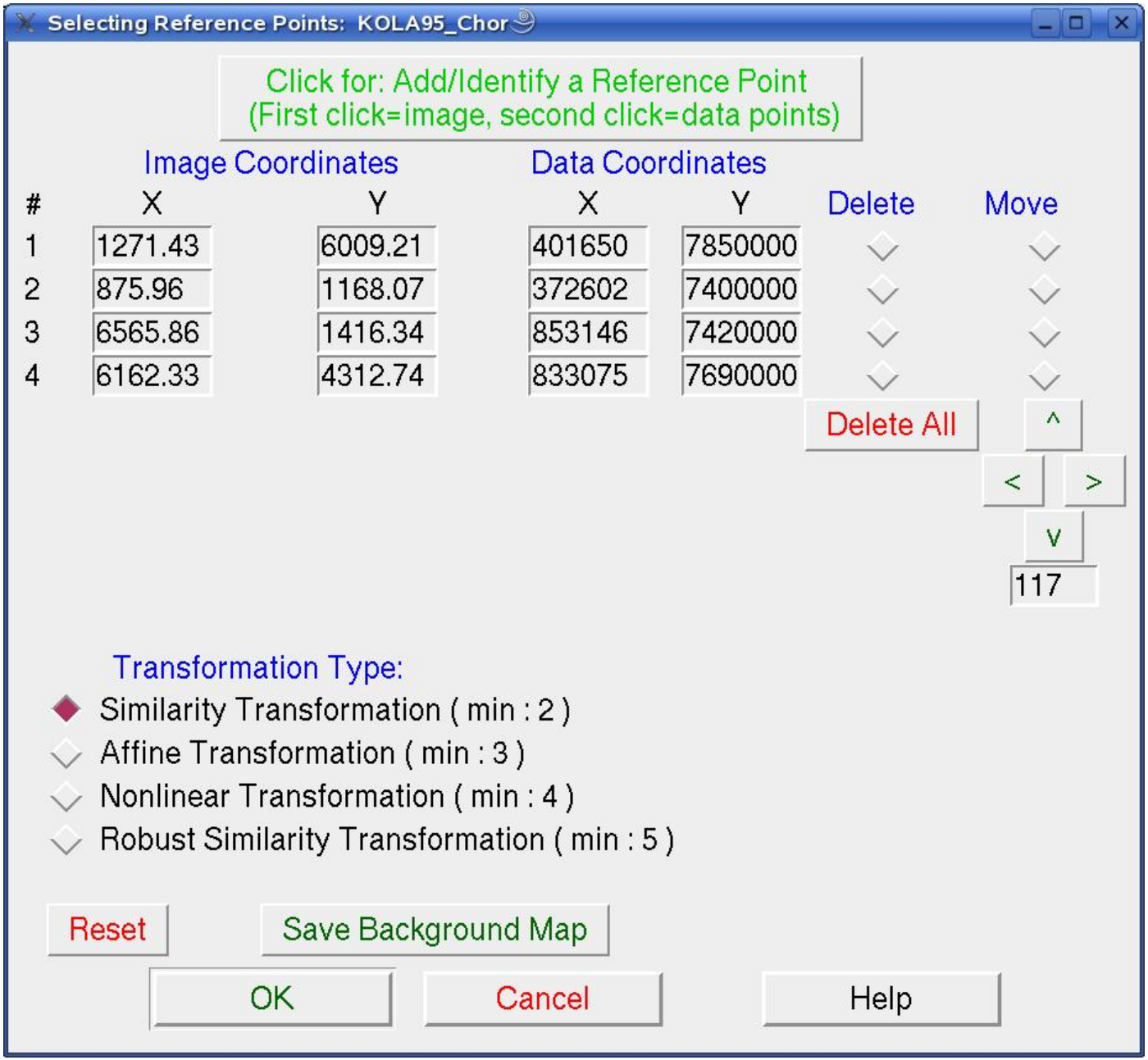
Background: Convert



Background: Convert

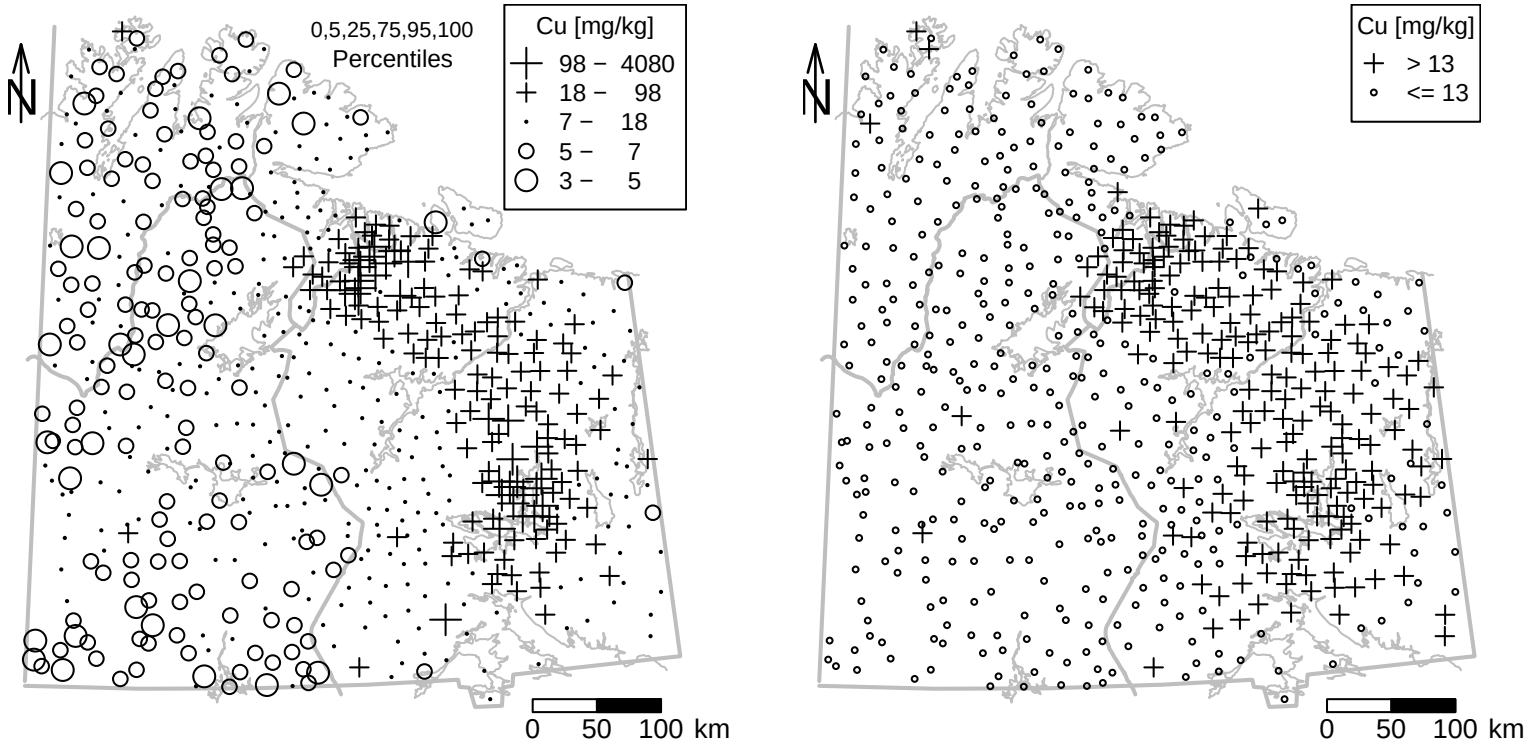


Background: Convert



Background: Convert

Result: Spatial Distrib. of Cu



Summary

- DAS+R is user friendly
- enables to construct complicated R-commands via the GUI
- high repeatability (fast prototyping)
- using of subsets (of variables/observations)
- emphasis on graphical analysis.
- Finally: Embedding of new functions should not be difficult!!!!

Outlook

To do:

- Complete intended methodology
- Enter all the subsets functionalities in the procedures where applicable
- Remove most of the bugs
- Fill all help buttons
- Submit the package to CRAN.