Turboveg in a nutshell

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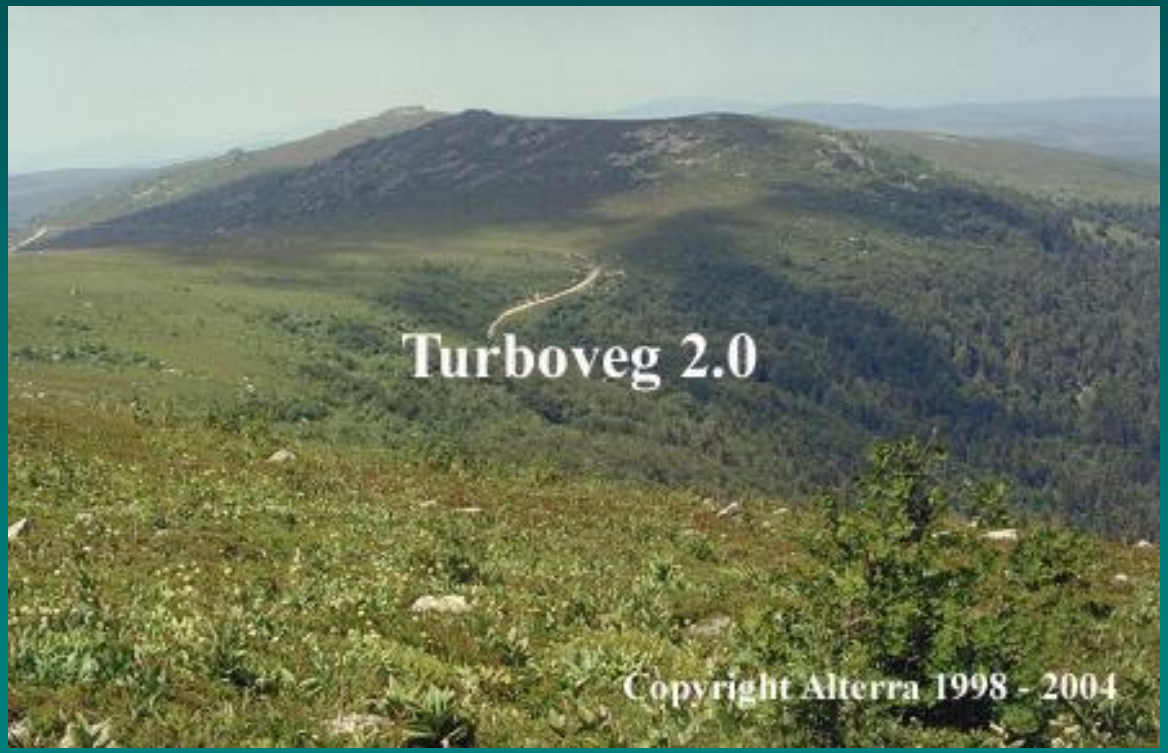
ALTERRA

Turboveg

An easy to install and easy to use Windows program for PC for managing vegetation plot data.



http://www.synbiosys.alterra.nl/turboveg

A comprehensive local database management system for storing, selecting and exporting vegetation plot data.

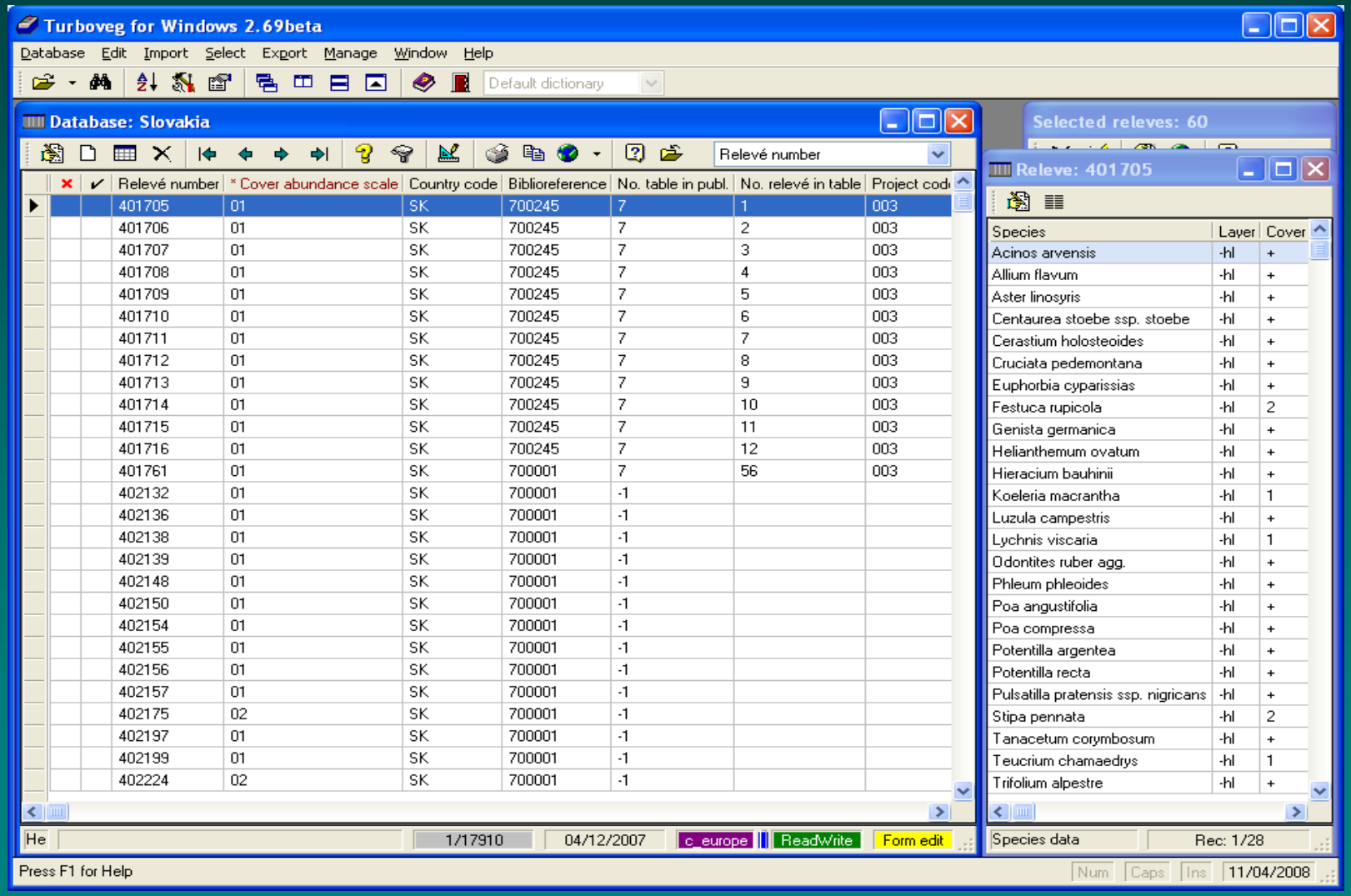
- Storage: Single plots, vegetation tables (manual input), Excel tables, XML files, Cornell condensed files (digital input).
- Selection: Selection on (any combination of) databases attributes, including species combination.
- Export: many export filters are included, like MS Access database, Excel files, XML files, CANOCO files, Shapefiles, Google Earth.

- Calculation of mean indicator values (e.g. Ellenberg)
- And more…

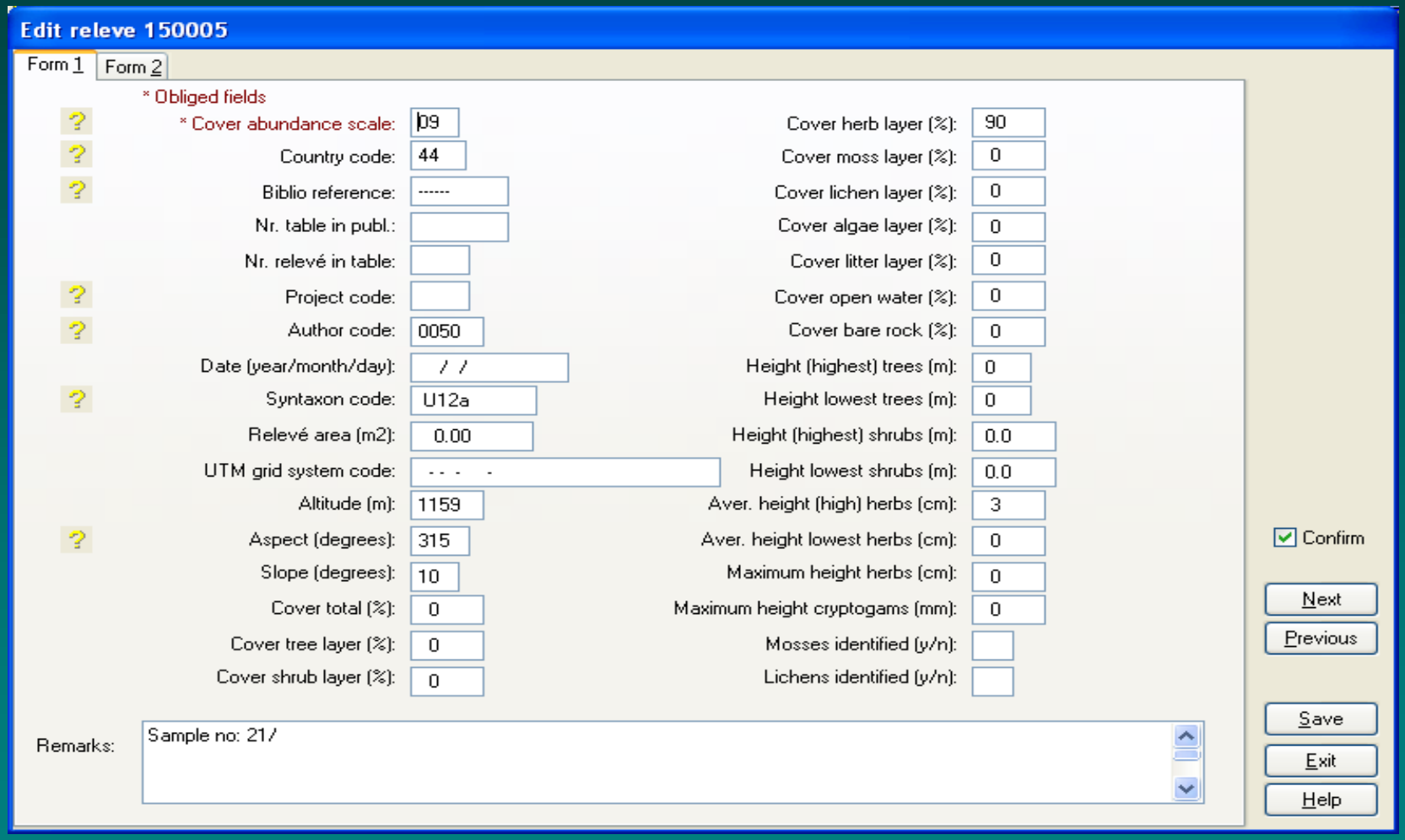
Turboveg database structure

- Is simple
- Is extendable
- Three dBase files and corresponding index file compose a database
    - header data
    - species data
    - remarks
- Turboveg can handle multiple databases and multiple species lists
- Connected to the databases a set of lookup tables (e.g. authors, projectc, etc.)

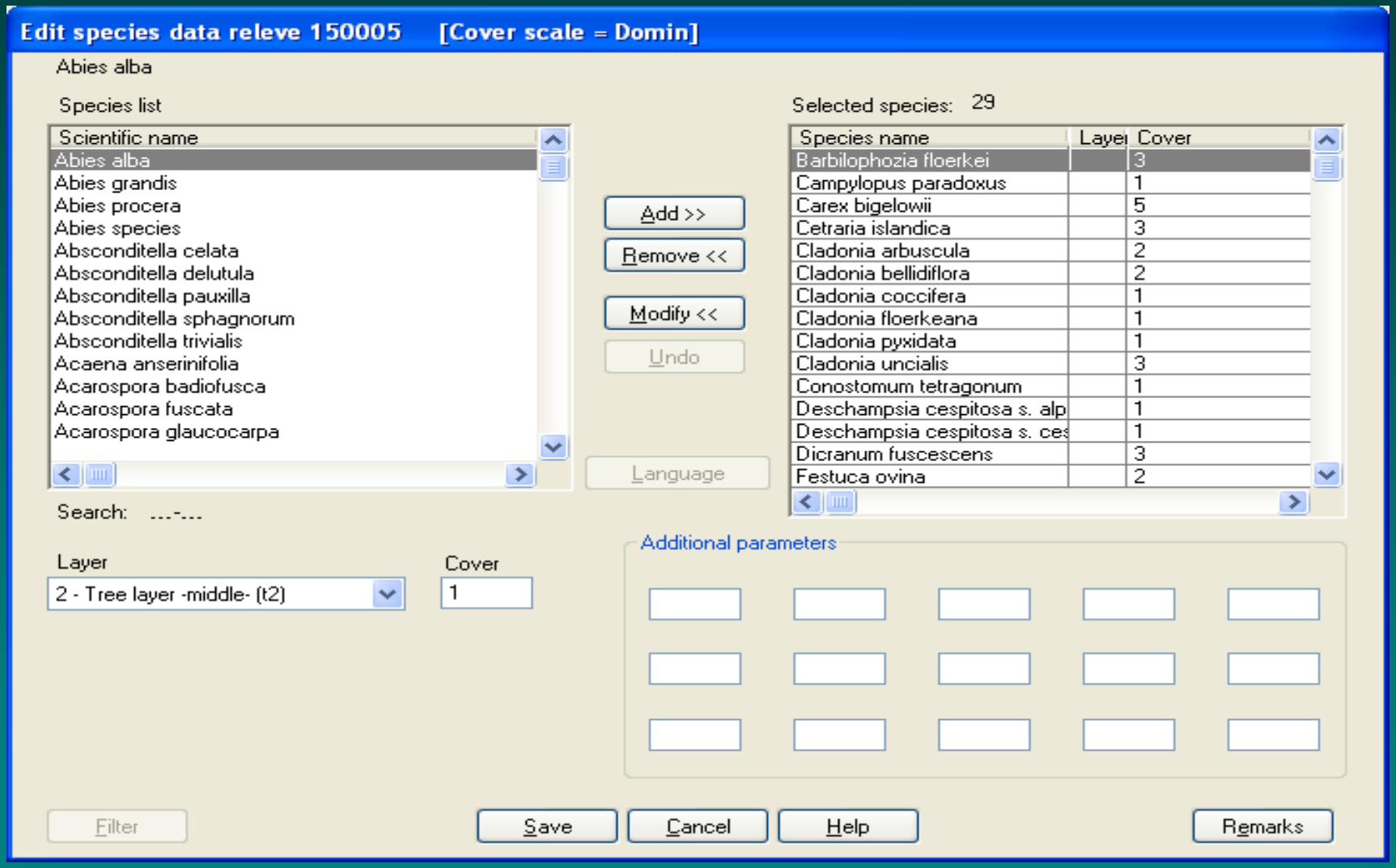
The input and management of vegetation data by using Turboveg



Data entry for header data

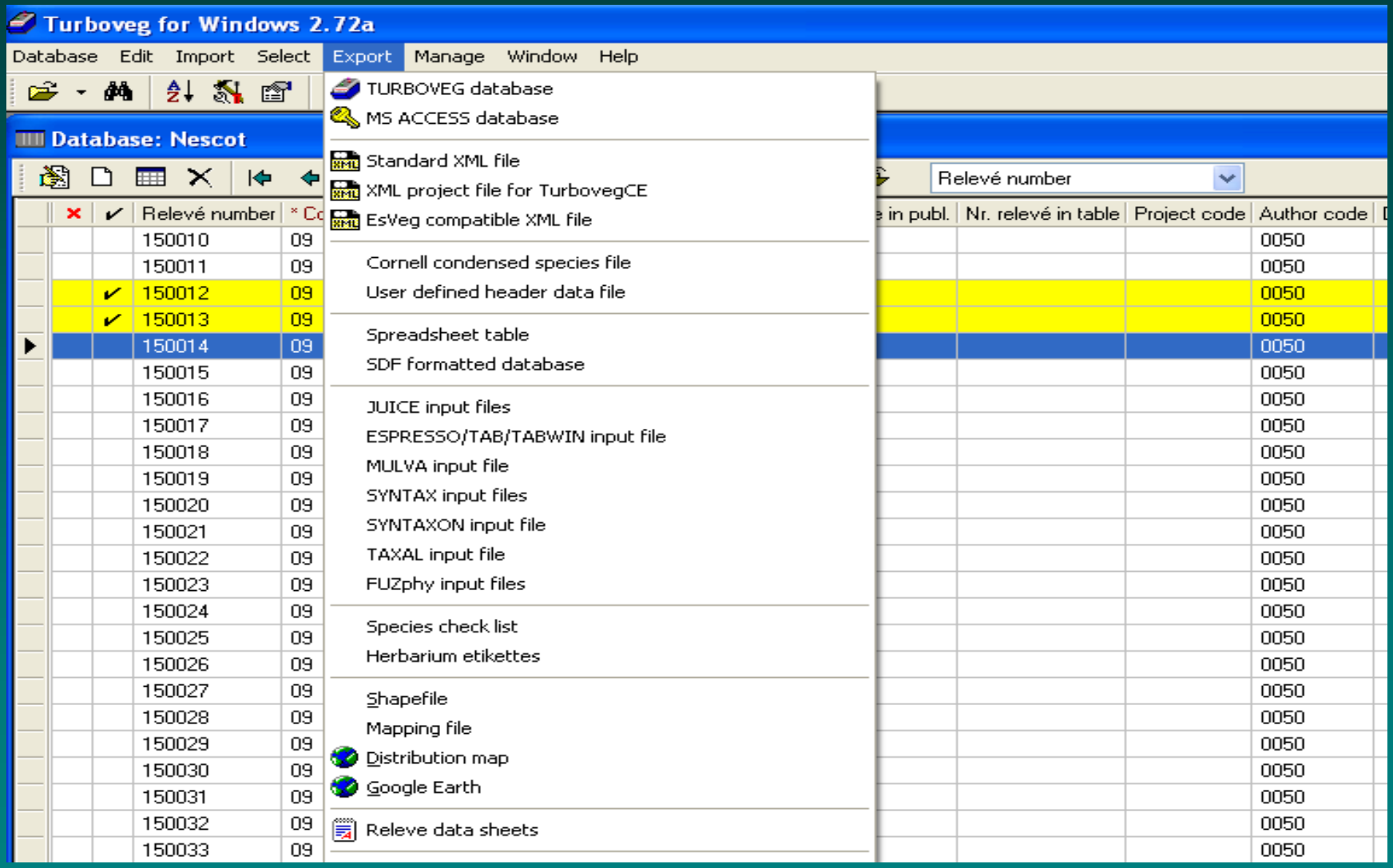


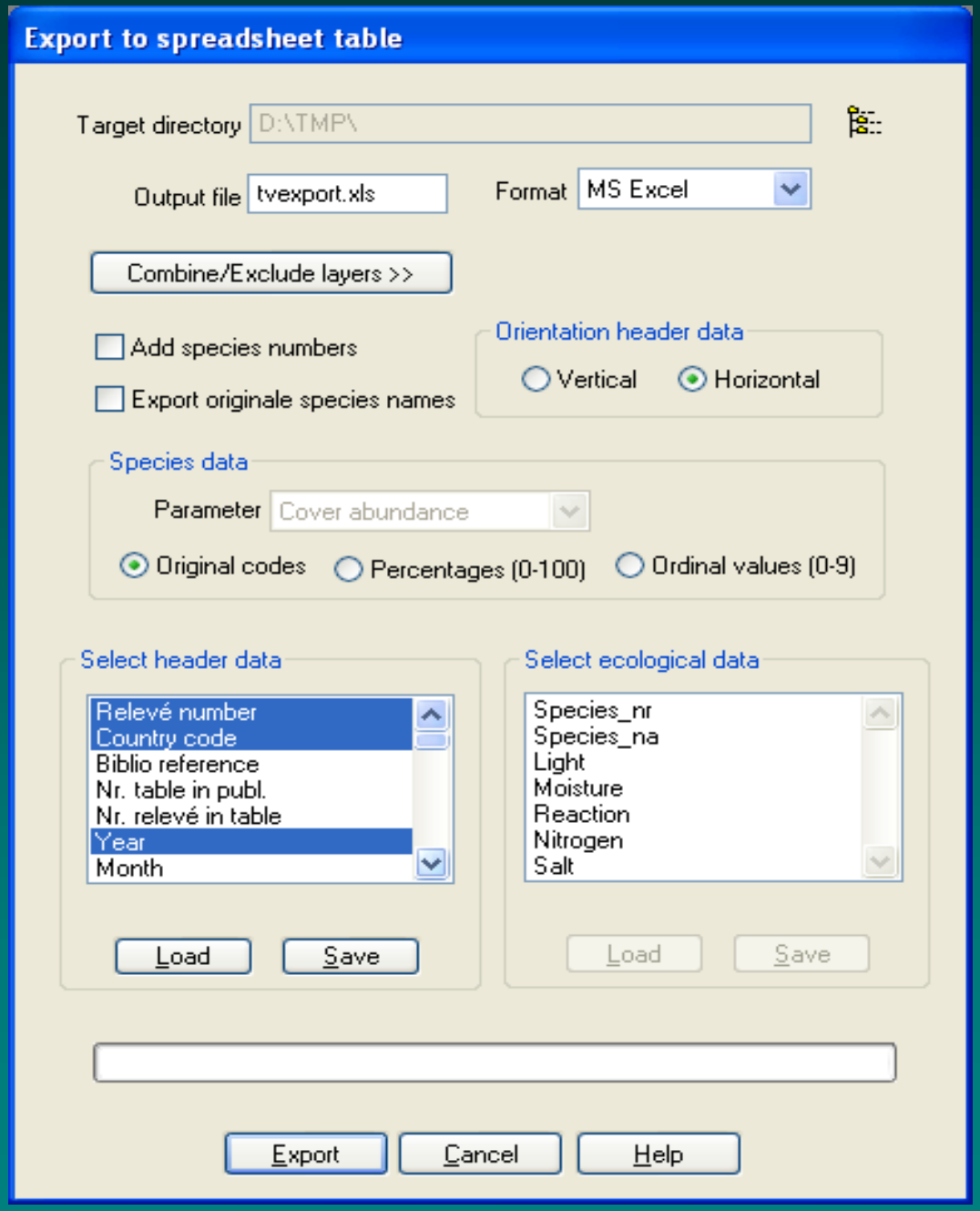
Species entry



Turboveg can use Google maps for geo-referencing plots

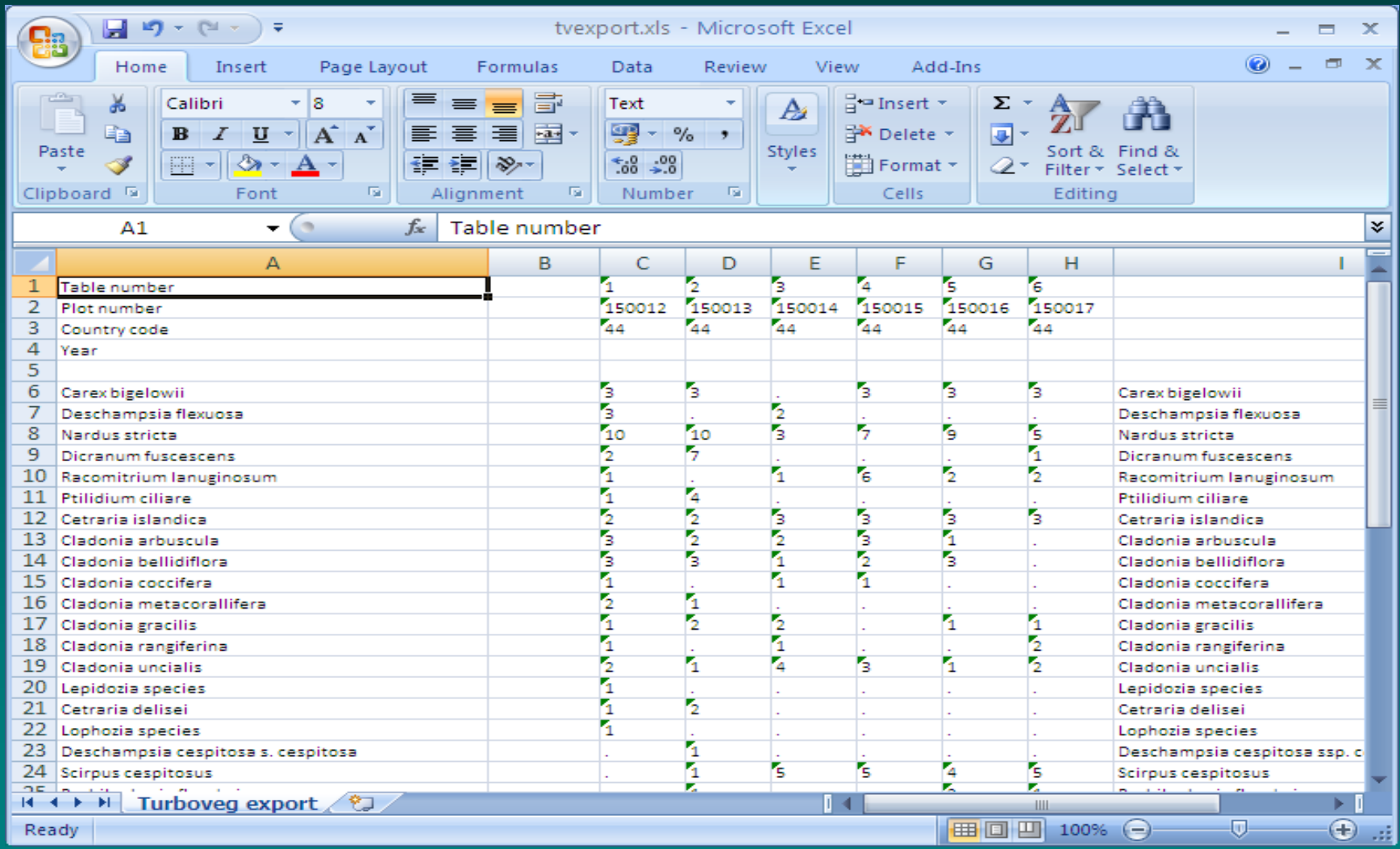
Turboveg provides many export filters





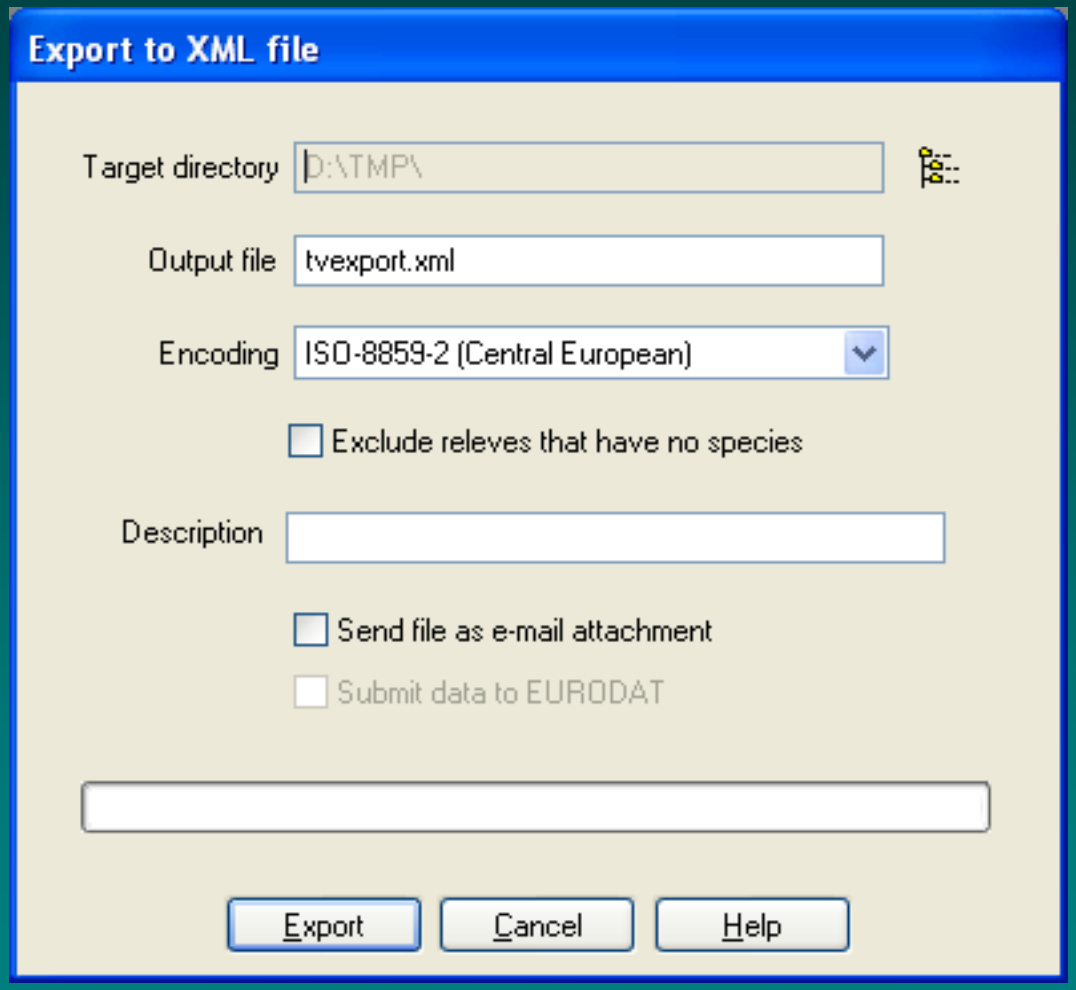
Example of an export filter: Excel table

The result in Excel

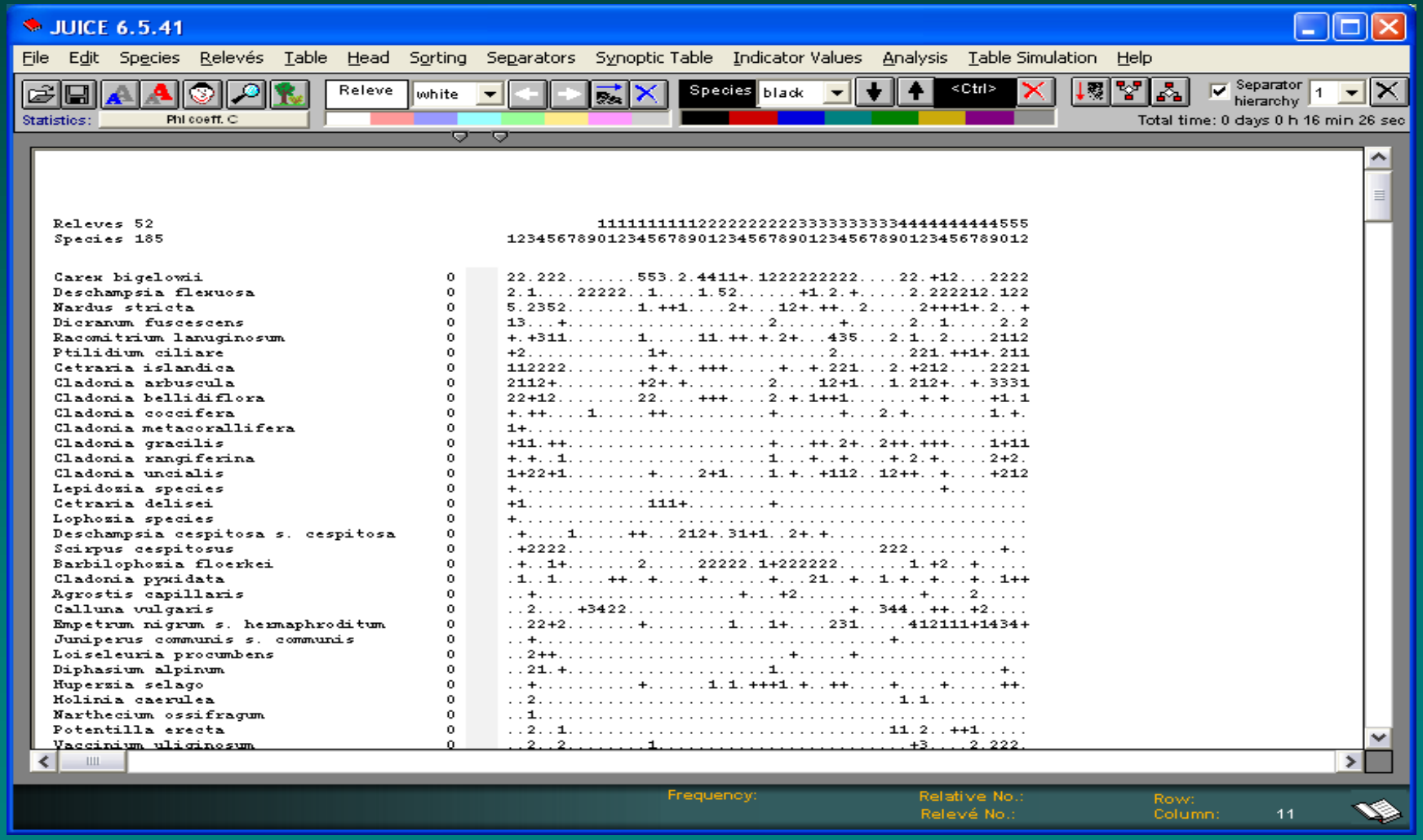


	A	B	C	D	E	F	G	H	I
1	Table number		1	2	3	4	5	6	
2	Plot number		150012	150013	150014	150015	150016	150017	
3	Country code		44	44	44	44	44	44	
4	Year								
5									
6	Carex bigelowii		3	3	.	3	3	3	Carex bigelowii
7	Deschampsia flexuosa		3	.	2	.	.	.	Deschampsia flexuosa
8	Nardus stricta		10	10	3	7	9	5	Nardus stricta
9	Dicranum fuscescens		2	7	.	.	.	1	Dicranum fuscescens
10	Racomitrium lanuginosum		1	.	1	6	2	2	Racomitrium lanuginosum
11	Ptilidium ciliare		1	4	.	.	.	.	Ptilidium ciliare
12	Cetraria islandica		2	2	3	3	3	3	Cetraria islandica
13	Cladonia arbuscula		3	2	2	3	1	.	Cladonia arbuscula
14	Cladonia bellidiflora		3	3	1	2	3	.	Cladonia bellidiflora
15	Cladonia coccifera		1	.	1	1	.	.	Cladonia coccifera
16	Cladonia metacorallifera		2	1	.	.	.	.	Cladonia metacorallifera
17	Cladonia gracilis		1	2	2	.	1	1	Cladonia gracilis
18	Cladonia rangiferina		1	.	1	.	.	2	Cladonia rangiferina
19	Cladonia uncialis		2	1	4	3	1	2	Cladonia uncialis
20	Lepidozia species		1	.	.	.	.	.	Lepidozia species
21	Cetraria delisei		1	2	.	.	.	.	Cetraria delisei
22	Lophozia species		1	.	.	.	.	.	Lophozia species
23	Deschampsia cespitosa s. cespitosa		.	1	.	.	.	.	Deschampsia cespitosa ssp. c
24	Scirpus cespitosus		.	1	5	5	4	5	Scirpus cespitosus

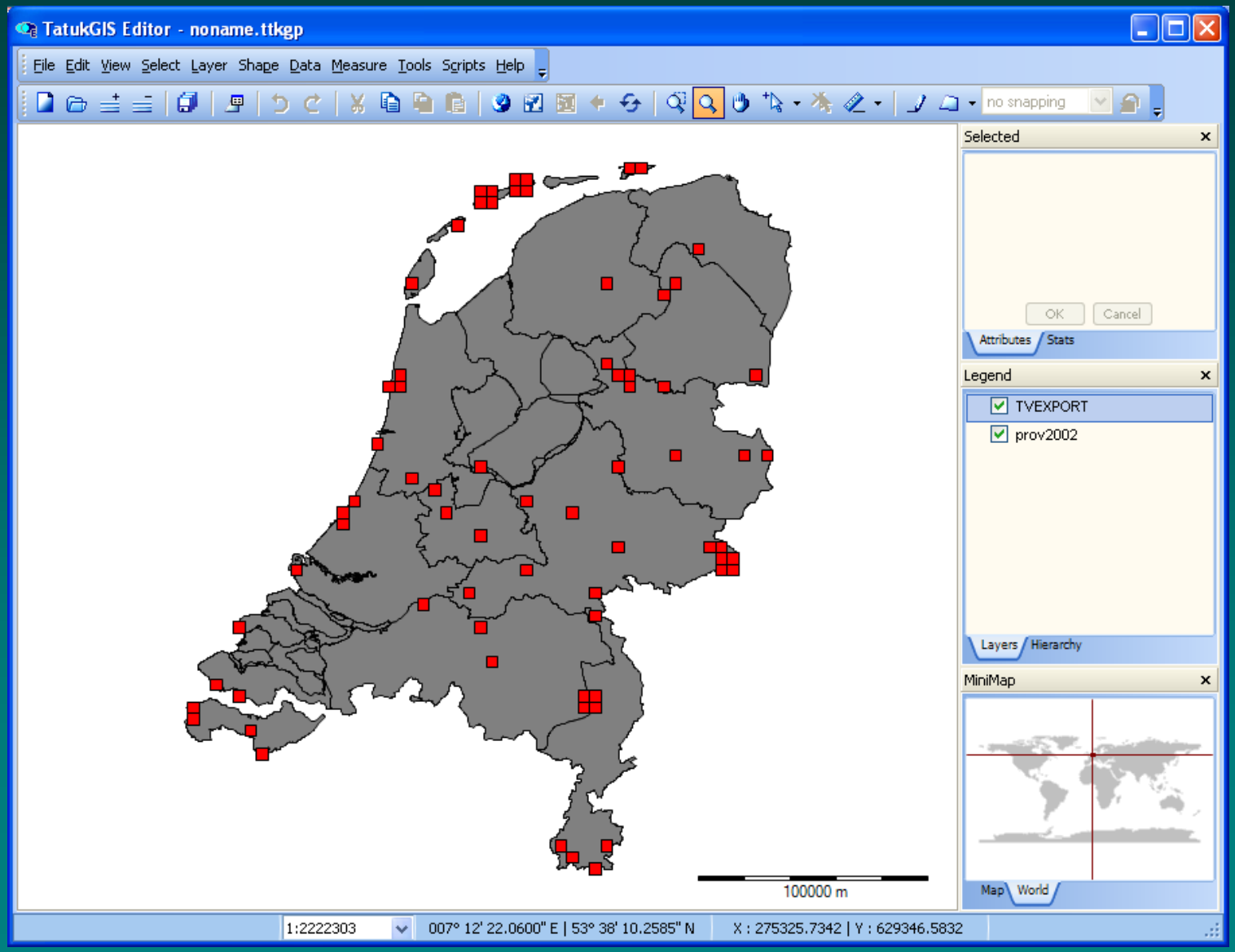
Export to XML (JUICE)



JUICE, software package for analyzing vegetation data



Export to shapefile as input for GIS



Export to...

- Access data base
- DarwinCore Archive (GBIF)
- Google Earth
- PostgreSQL database (currently only in Dutch version)
- and more...

Where is Turboveg in use?

- In almost every European country.
- Outside Europe in Argentina, Brazil, China, Columbia, Egypt, Japan, Russia, South-Africa, South-Korea, USA, and some more.

Worldwide a few thousand users.

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Worldwide about 2000 users

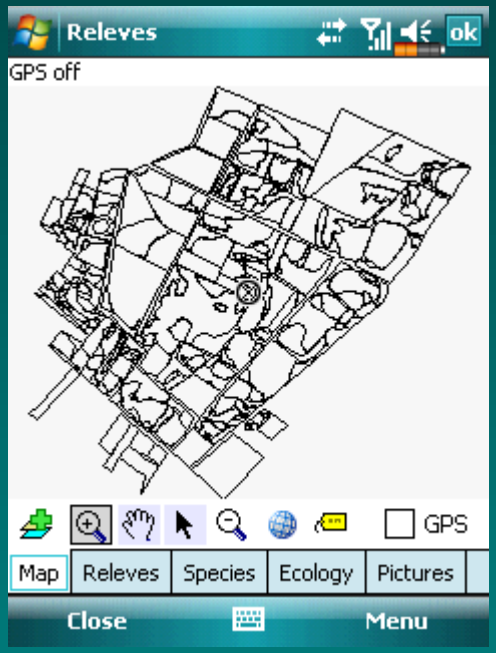
What is not so good in Turboveg

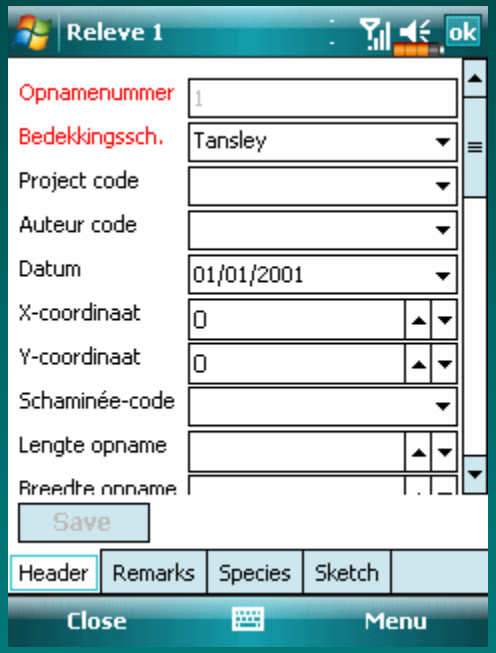
- Only two data types are supported, numerical and alpha-numerical.
- Poor taxon concept model.
- Poor in handling missing values.
- Not possible to store geometries, other than points (polygons, lines).
- No meta data storage.
- No support for nested plots.

- ..but, these issues will be taken care of in the next major release of Turboveg.

TurbovegCE

Turboveg Compact Edition supports GPS/GIS and has a seamless data exchange with TurbovegPC





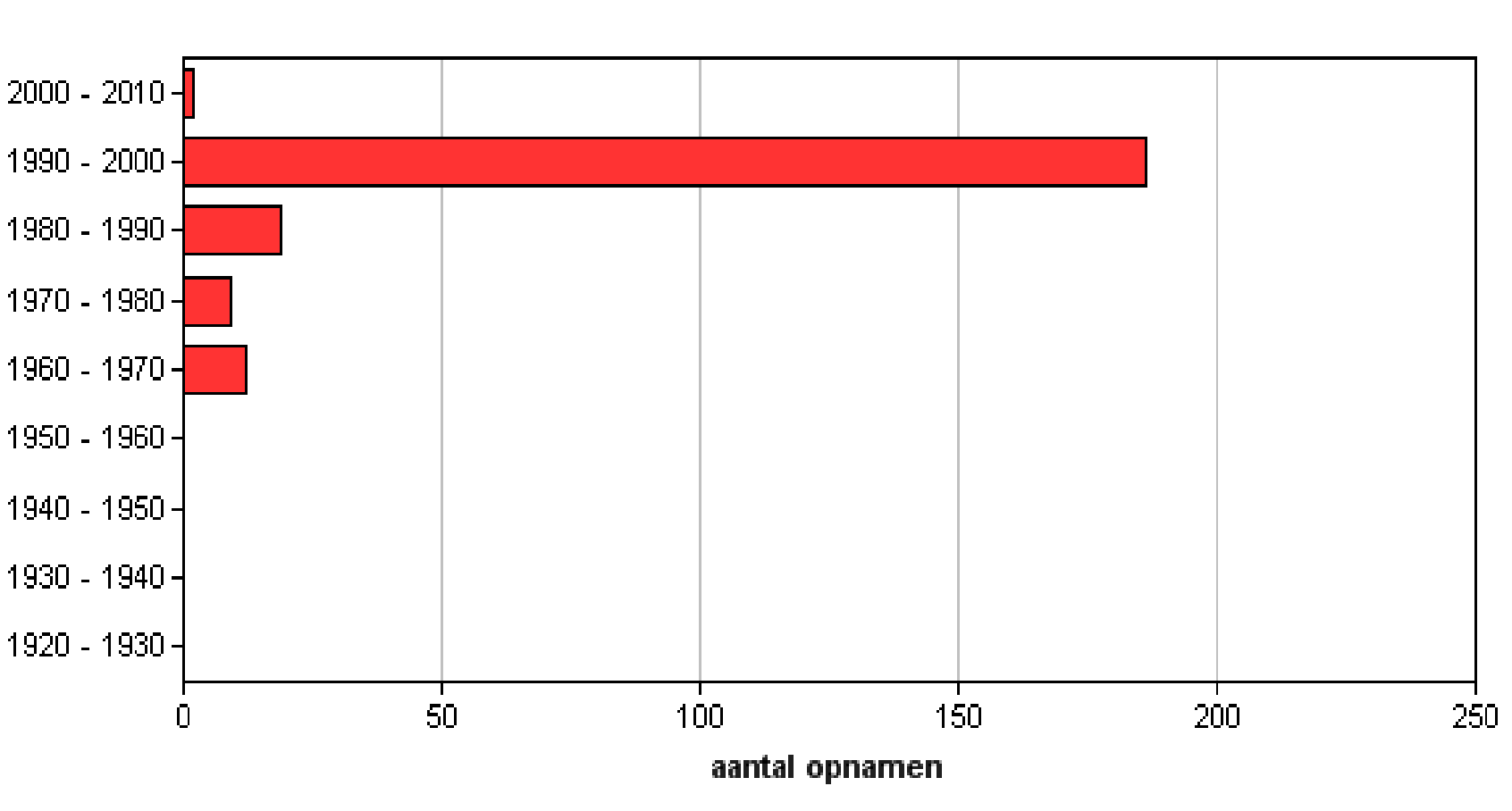
Data storage in a SQL data base

The Dutch National Vegetation Database

- More then 600.000 vegetation plots divided over more then 80 Turboveg database of various size, and exported into an open source SQL database - PostgreSQL/PostGIS.
- The database was set up more then 20 years ago to enable the classification of vegetation of the Netherlands.
- Both classification and database have proven to be a great source for all kind of applications.

Selection of an area of interest using a Google maps web application

Number of plots per decade



Natura 2000 habitat types

Habitattypen

Code	Naam	Periode	Aantal
6410	Grasland met Molinia op kalkhoudende, venige, of lemige kleibodem (Eu-Molinion)	(1979 - 1999)	46
6430	Voedselrijke zoomvormende ruigten van het laagland, en van de montane en alpiene zones	(1997)	2
7140	Overgangs- en trilveen	(1999)	2
91E0	*Alluviale bossen met Alnus glutinosa en Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	(1984)	2
Totaal aantal opnamen toegewezen aan habitattypen			**52**

Plant communities

Plantengemeenschappen

Code	Naam	Periode	Aantal
16AB01	Crepido-Juncetum acutiflori	(1967 - 1999)	42
08RG08	RG Carex acutiformis-[Phragmitetalia]	(1967 - 1997)	17
16AB06	Angelico-Cirsietum oleracei	(1979 - 1997)	10
32AA01A	Valeriano-Filipenduletum calamagrostietosum	(1967 - 1997)	10
16AB05	Scirpetum sylvatici	(1984 - 1997)	7
16RG02	RG Holcus lanatus-Lychnis flos-cuculi-[Molinietalia]	(1979 - 1997)	7
16AA01B	Cirsio dissecti-Molinietum typicum	(1989 - 1997)	5
36AA02B	Salicetum typicum	(1984 - 1997)	5
16RG06	RG Carex disticha-[Calthion palustris]	(1979 - 1997)	4
28AA01B	Cicendietum filiformis juncetosum	(1997)	4

Detailed information of the plots

Vegetatieopnamen

U kunt onderstaande tabel sorteren op verschillende criteria. Kies uit de kopregel een aspect waarop u de tabel wilt sorteren. Kies het opnamenummer voor gedetailleerde informatie.

Geselecteerd aantal opnamen: **228**

Opnamenr.	Bronhouder	Jaar	Code pg.	Naam plantengemeenschap
53157	Staatsbosbeheer	1967	16AB01	Crepido-Juncetum acutiflori
53158	Staatsbosbeheer	1967	32AA01A	Valeriano-Filipenduletum calamagrostietosum
53159	Staatsbosbeheer	1967	32AA01A	Valeriano-Filipenduletum calamagrostietosum
53161	Staatsbosbeheer	1967	32AA01A	Valeriano-Filipenduletum calamagrostietosum
53162	Staatsbosbeheer	1967	32AA01A	Valeriano-Filipenduletum calamagrostietosum
53163	Staatsbosbeheer	1967	08BC03	Caricetum vesicariae
53164	Staatsbosbeheer	1967	08RG08	RG Carex acutiformis-[Phragmitetalia]
53165	Staatsbosbeheer	1967	08RG08	RG Carex acutiformis-[Phragmitetalia]
53166	Staatsbosbeheer	1967	08RG08	RG Carex acutiformis-[Phragmitetalia]
101698	Prov. Gelderland	1981	16RG02	RG Holcus lanatus-Lychnis flos-cuculi-[Molinietalia]

Opnameschaal: Ordinale schaal

Soortnaam	Vegatatielaag	Bedekking
Achillea ptarmica (Wilde bertram)		2
Agrostis stolonifera (Fioringras)		5
Angelica sylvestris (Gewone engelwortel)		2
Cardamine pratensis (Pinksterbloem)		2
Carex disticha (Tweerijige zegge)		5

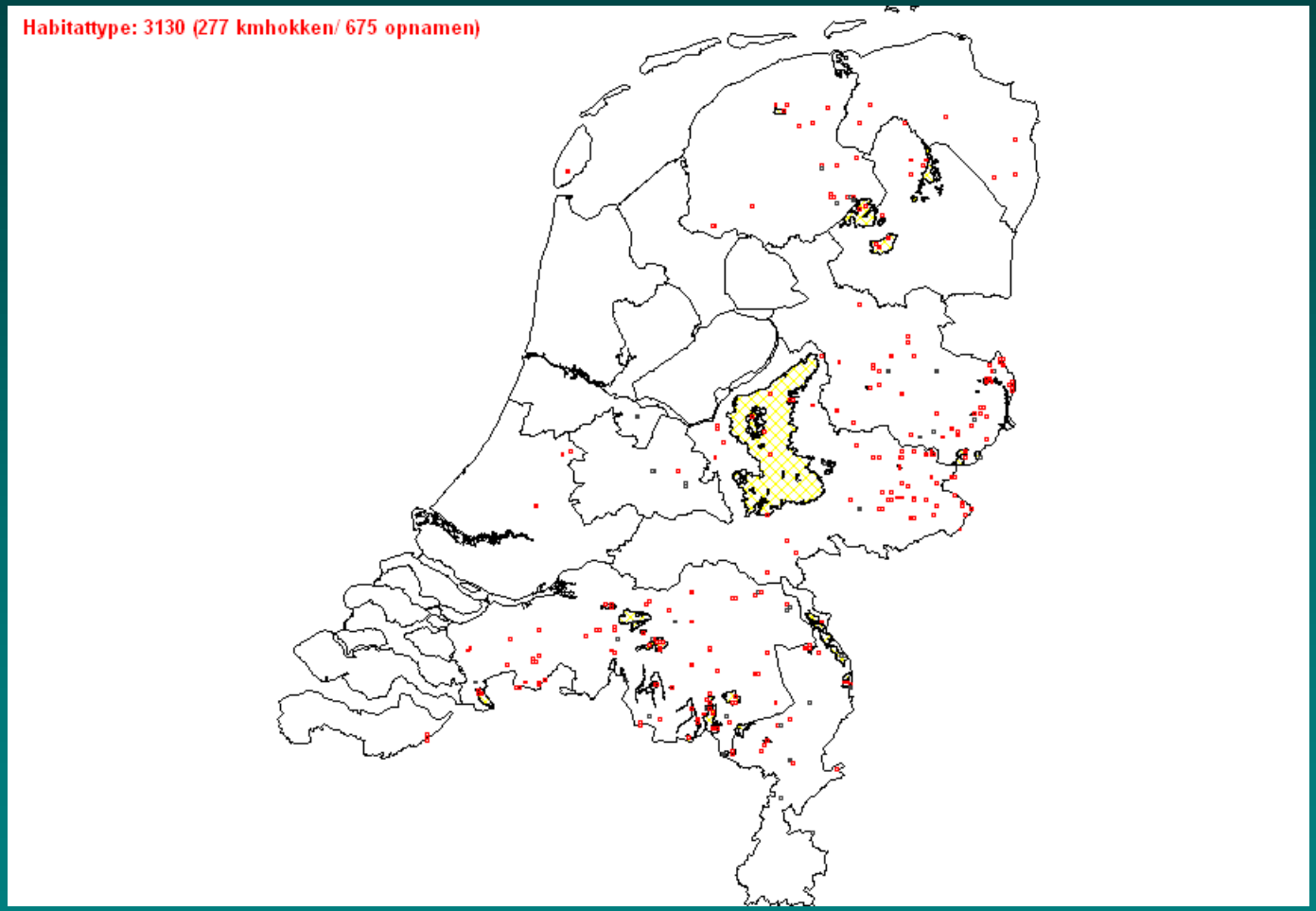
Short demo of the web tool

- http://www.synbiosys.alterra.nl/lvd

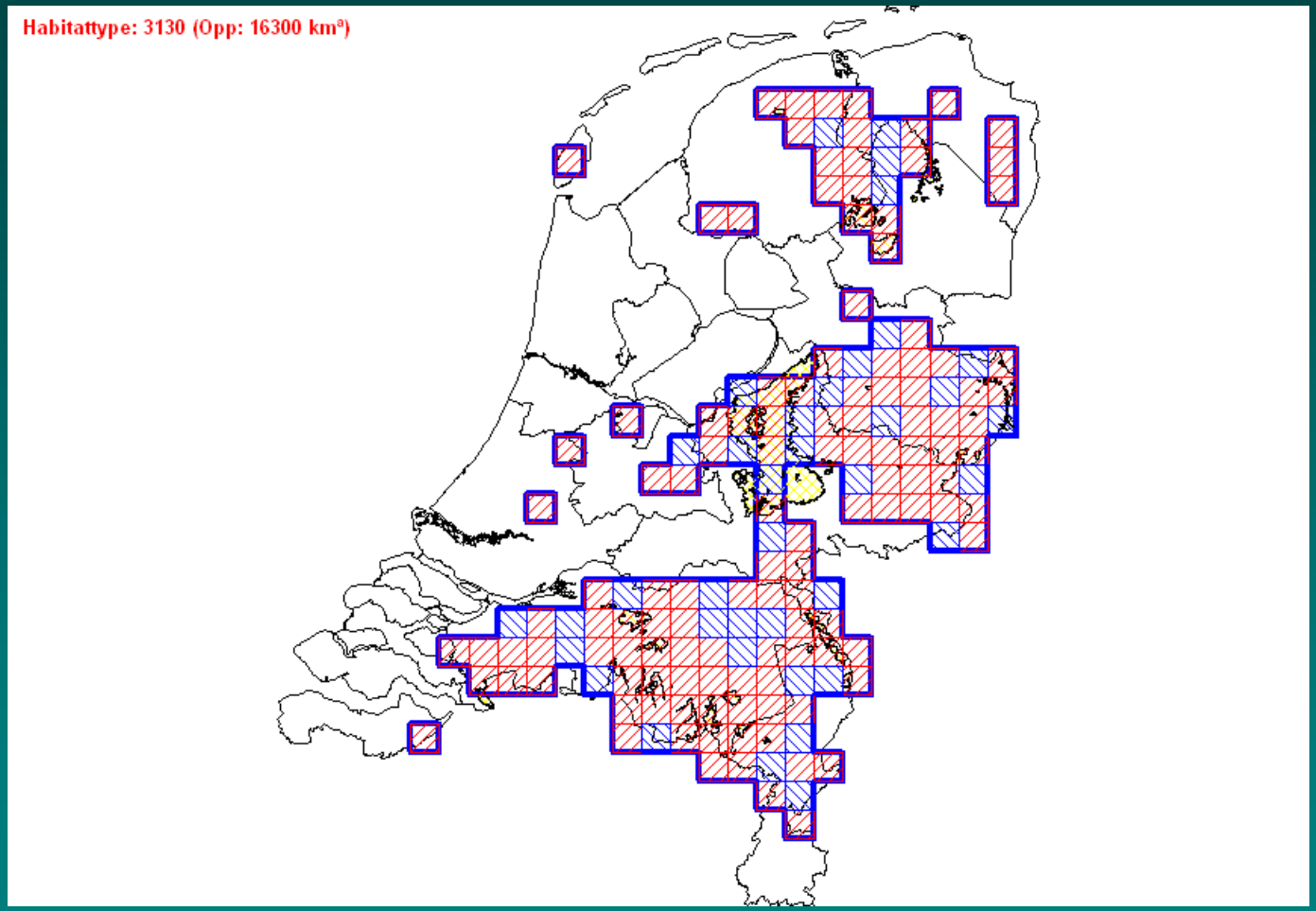
Applications for Natura 2000 using the Dutch National Vegetation Database

1. In a first step each vegetation plot is assigned to a plant community.
2. Then, by means of the assigned plant community type and additional criteria (e.g. GIS layers) each plots is assigned (if possible) to a habitat type.
3. On the basis of plots which have assigned habitat types both distribution and range can computed and reported to the EU.

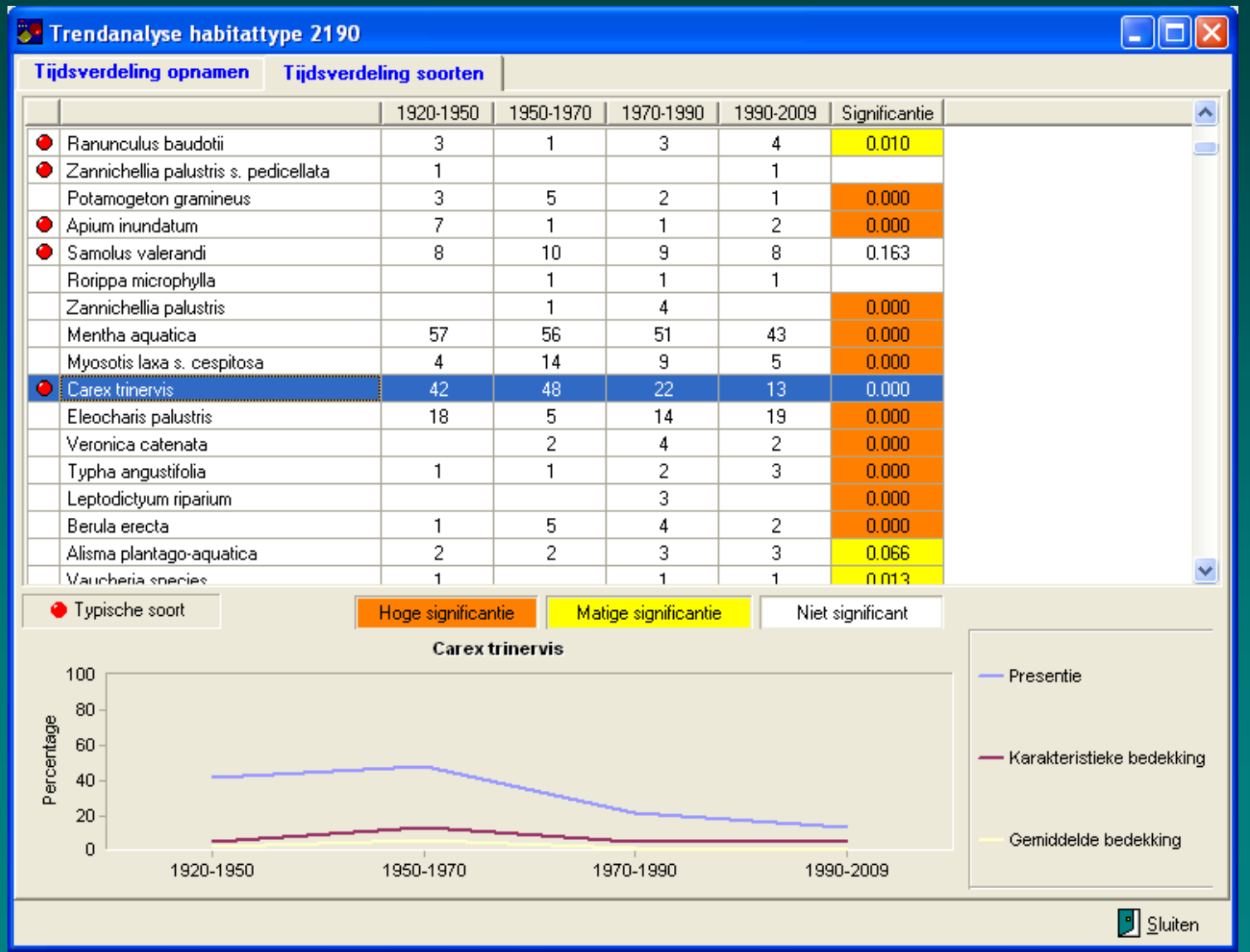
Applications for Natura 2000
- Actual distribution (1 x 1 km) -



Applications for Natura 2000
- Distribution range (10 x 10 km) -



Applications for Natura 2000
- Trend analysis -



	1920-1950	1950-1970	1970-1990	1990-2009	Significantie
Ranunculus baudotii	3	1	3	4	0.010
Zannichellia palustris s. pedicellata	1			1	
Potamogeton gramineus	3	5	2	1	0.000
Apium inundatum	7	1	1	2	0.000
Samolus valerandi	8	10	9	8	0.163
Rorippa microphylla		1	1	1	
Zannichellia palustris		1	4		0.000
Mentha aquatica	57	56	51	43	0.000
Myosotis laxa s. cespitosa	4	14	9	5	0.000
Carex trinervis	42	48	22	13	0.000
Eleocharis palustris	18	5	14	19	0.000
Veronica catenata		2	4	2	0.000
Typha angustifolia	1	1	2	3	0.000
Leptodictyum riparium			3		0.000
Berula erecta	1	5	4	2	0.000
Alisma plantago-aquatica	2	2	3	3	0.066
Vaucheria species	1		1	1	0.013

Braun-Blanquet, one of the founders of vegetation research in the 20th century