

ALTER-Net & MORIS Ontologies

Developing a common denominator for LTER-Europe



NSF/NCEAS Observations Workshop

Santa Barbara, 9.-11. December 2007

**Michael Mirtl,
Katharina Schleidt, Herbert Schentz,
Johannes Peterseil, Bert v.d. Werf**

**ALTER-Net: Overarching Goal „LTER-
Europe“ &
Work Packages I3, I6**

LTER-Europe
MORIS

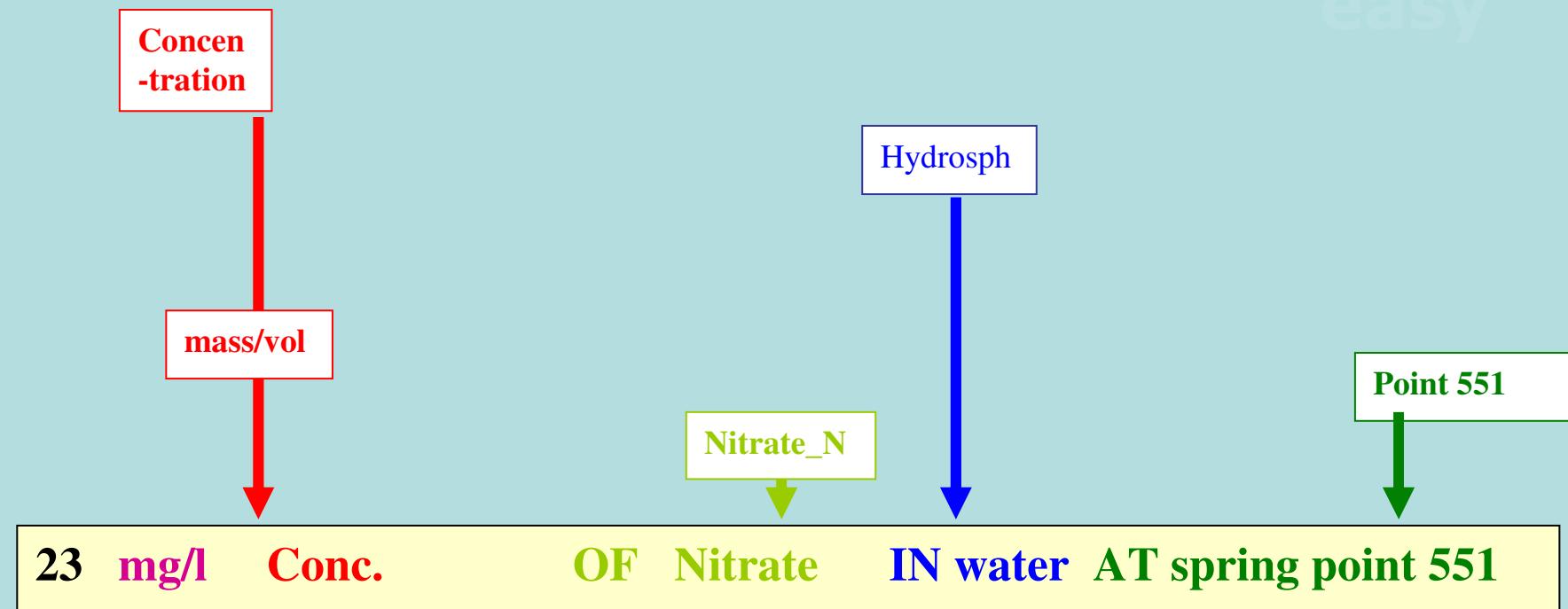
**Concen
-tration**

Hydrosph

Point 551

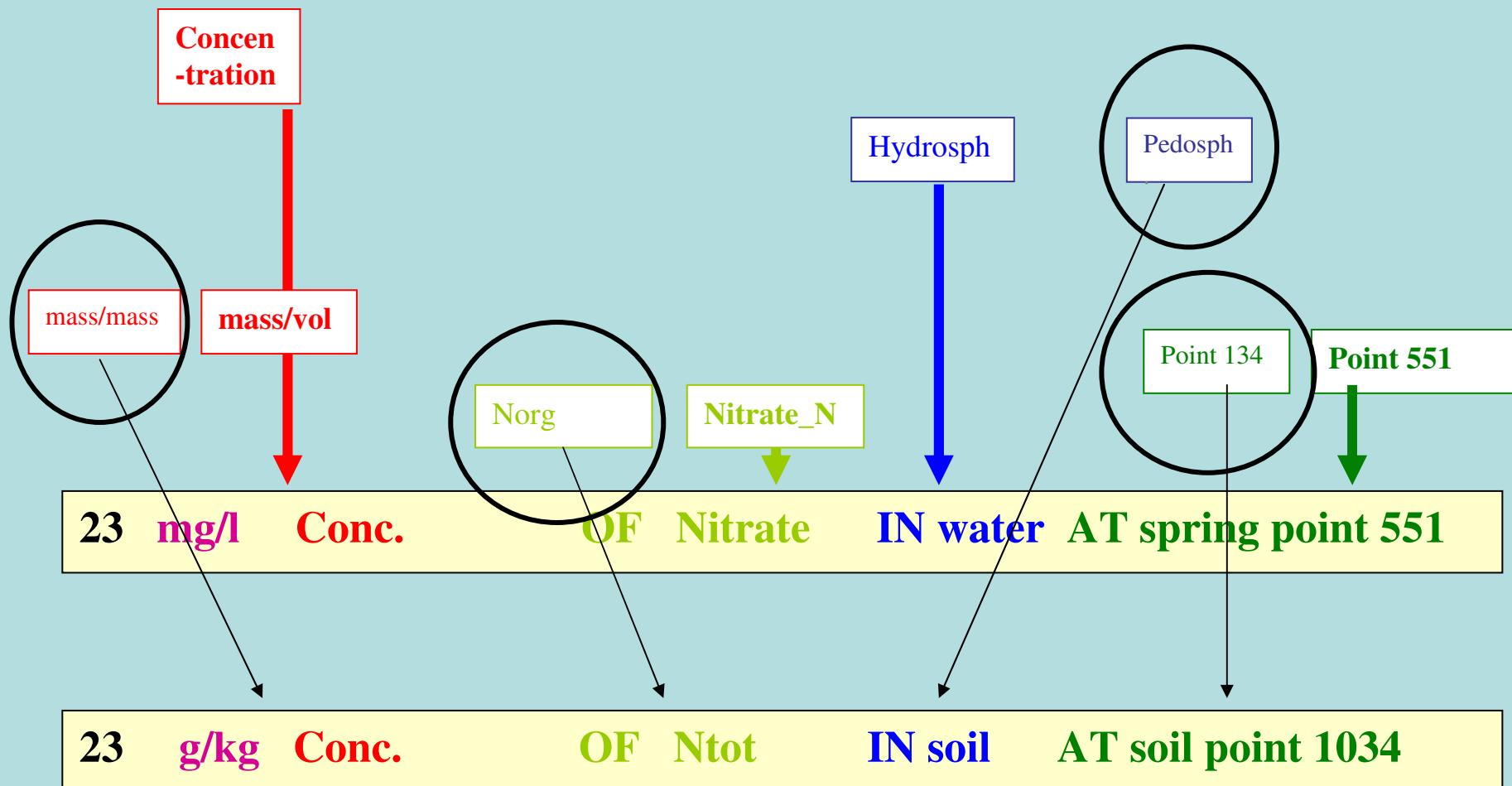
Nitrate_N





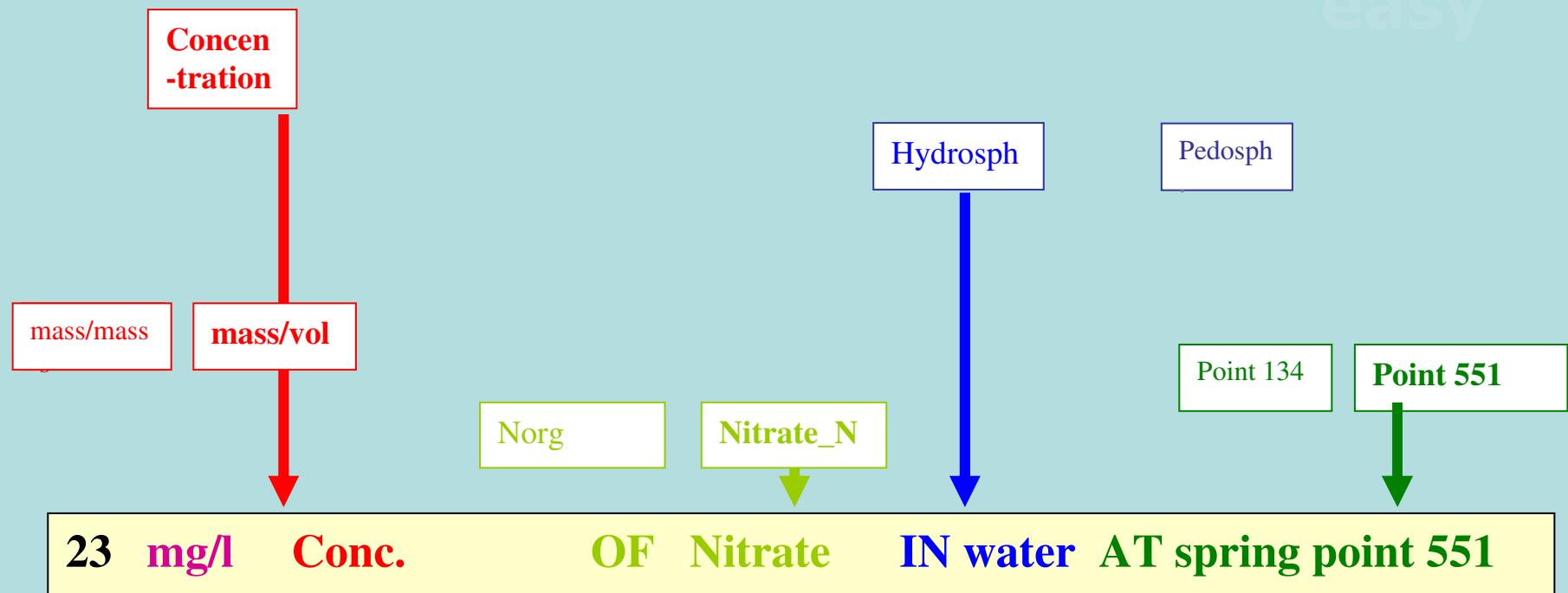
VALUE

UNIT



VALUE

UNIT



23 g/kg Conc. OF Ntot IN soil AT soil point 1034

VALUE

UNIT

PARAMETER [what] (char.)

**Concen-
tration**

mass/mass

mass/vol

System Layer

Observ. location.

Hydrosph

Pedosph

Nitrogen

Norg

Nitrate_N

Point 134

Point 551

23 mg/l Conc.

OF Nitrate

IN water AT spring point 551

?

23 g/kg Conc.

OF Ntot

IN soil AT soil point 1034

?

?

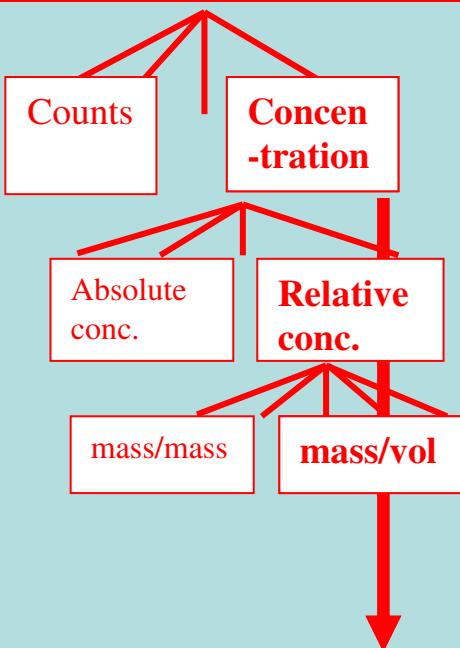
?

VALUE

UNIT



PARAMETER [what] (char.)



23 mg/l Conc.

OF Nitrate IN water AT spring point 551

?

23 g/kg Conc.

OF Ntot IN soil AT soil point 1034

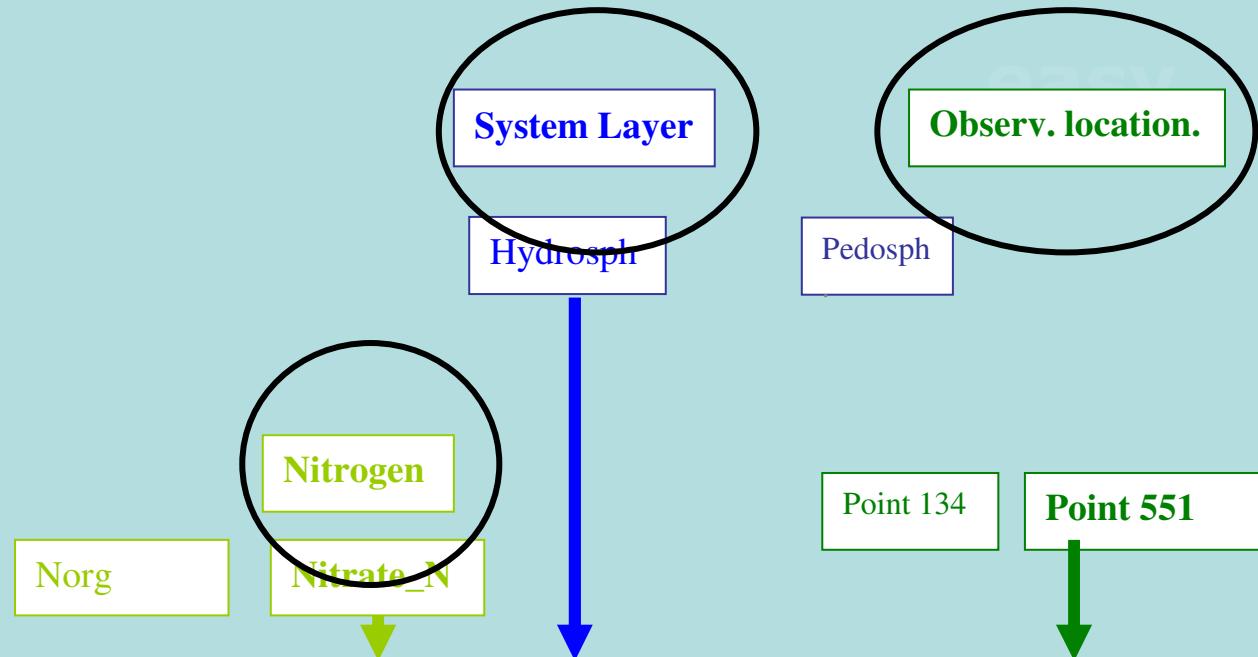
?

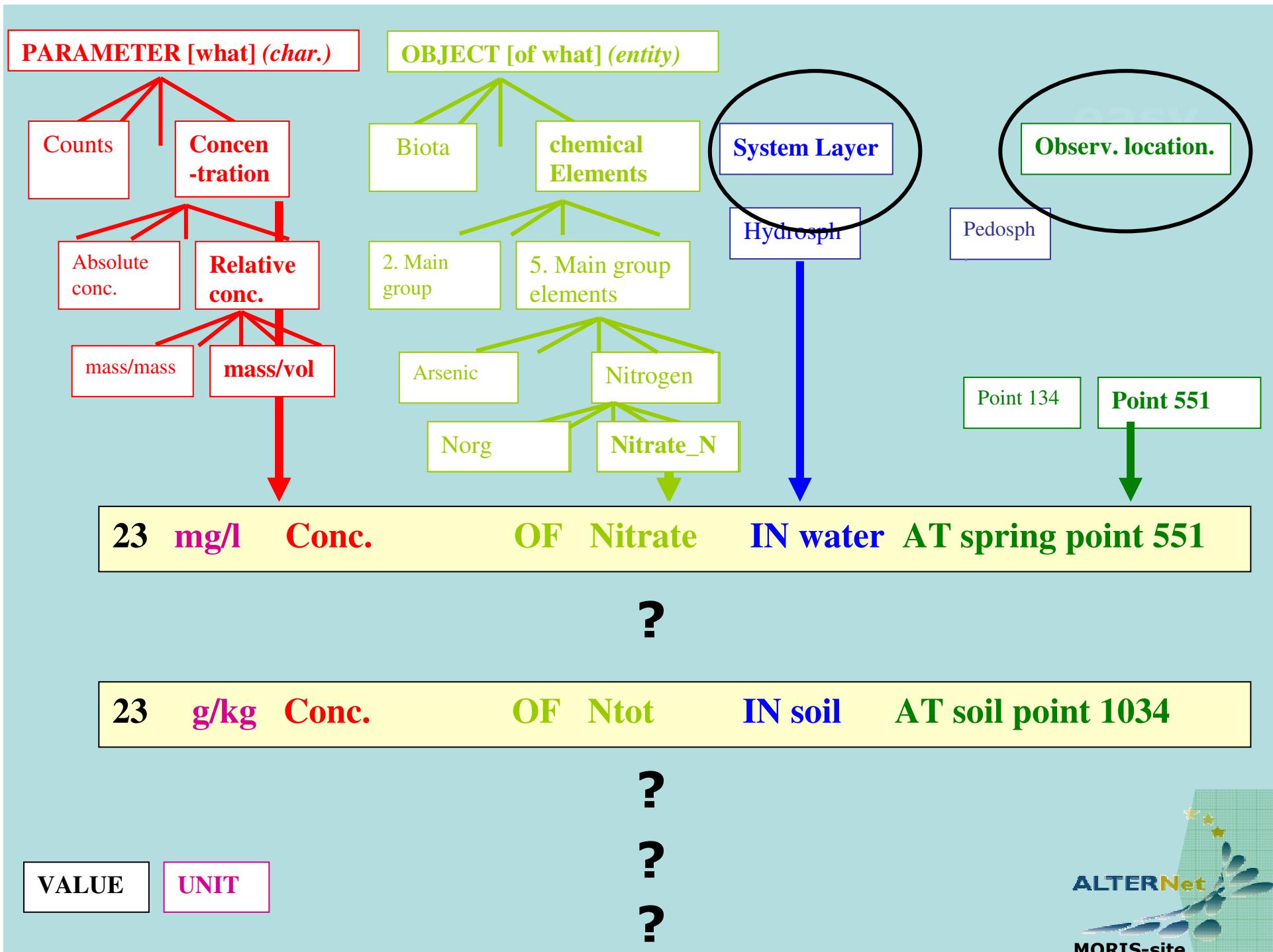
?

?

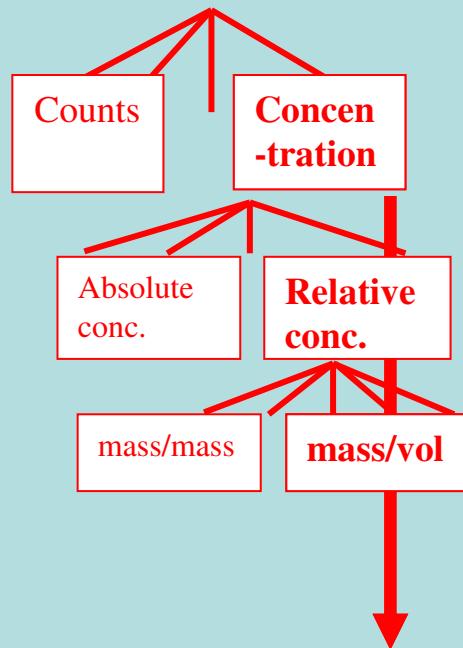
VALUE

UNIT

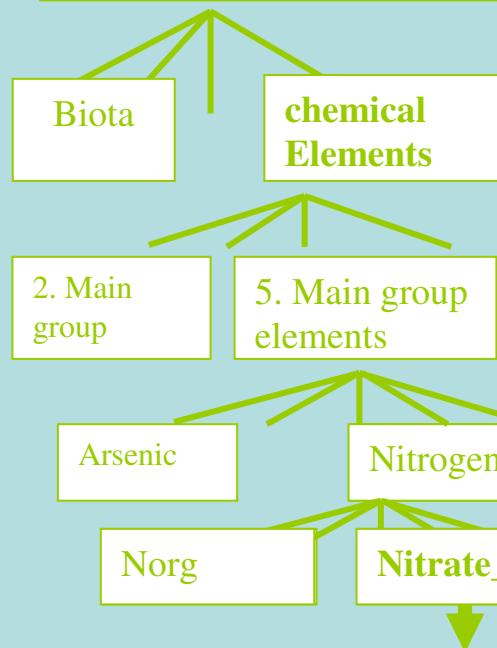




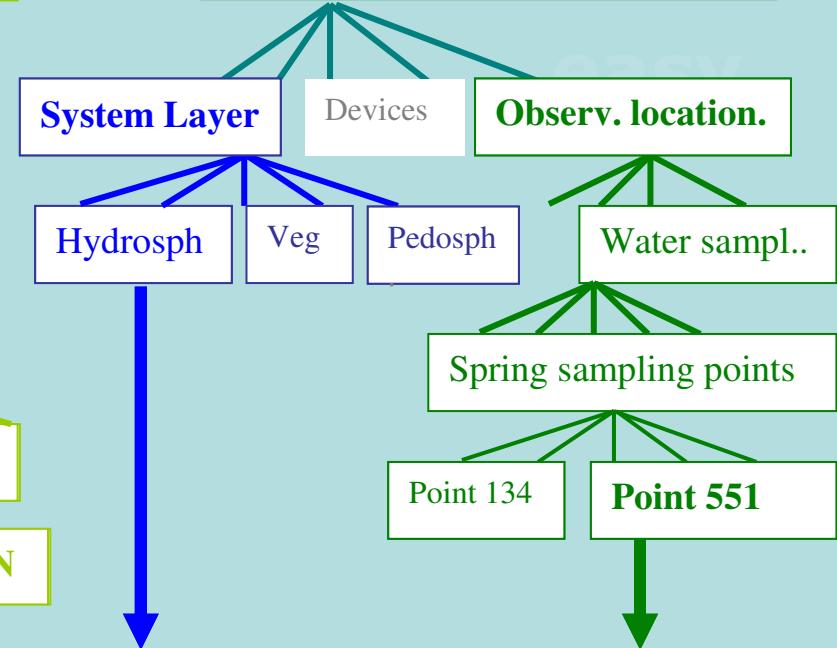
PARAMETER [what] (char.)



OBJECT [of what] (entity)



OBJECT [where] (entity)



23 mg/l Conc.

OF Nitrate

IN water AT spring point 551

?

23 g/kg Conc.

OF Ntot

IN soil AT soil point 1034

?

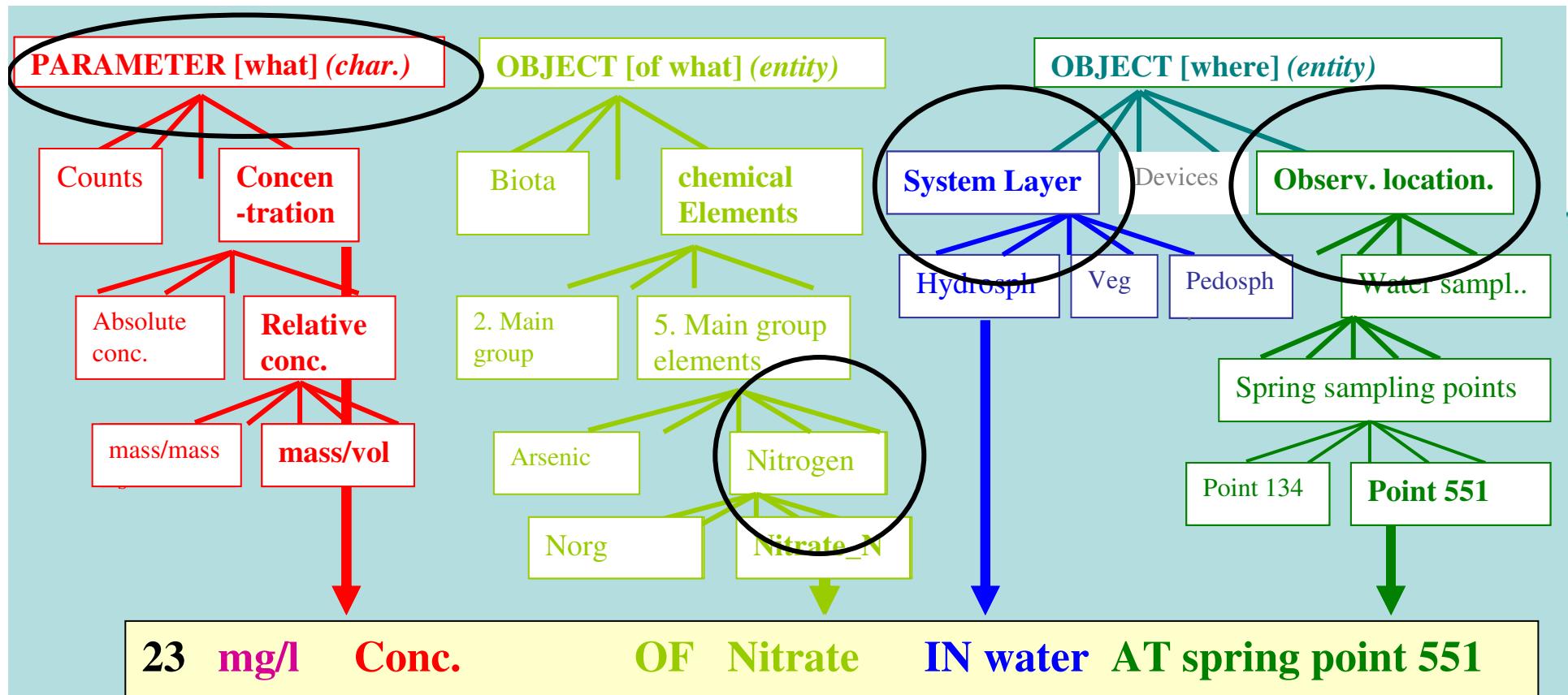
?

?

VALUE

UNIT





?

23 g/kg Conc. OF Ntot IN soil AT soil point 1034

?

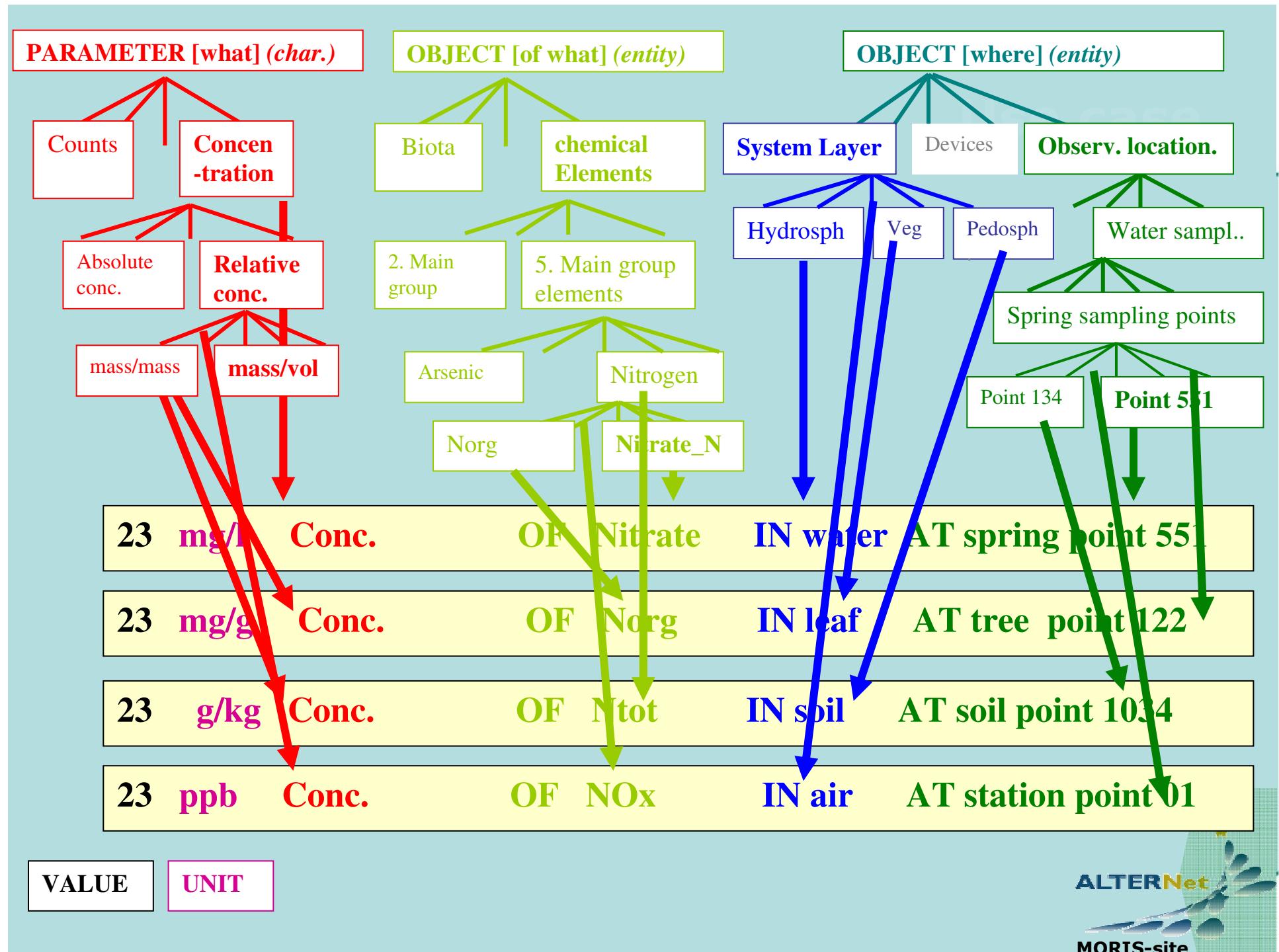
?

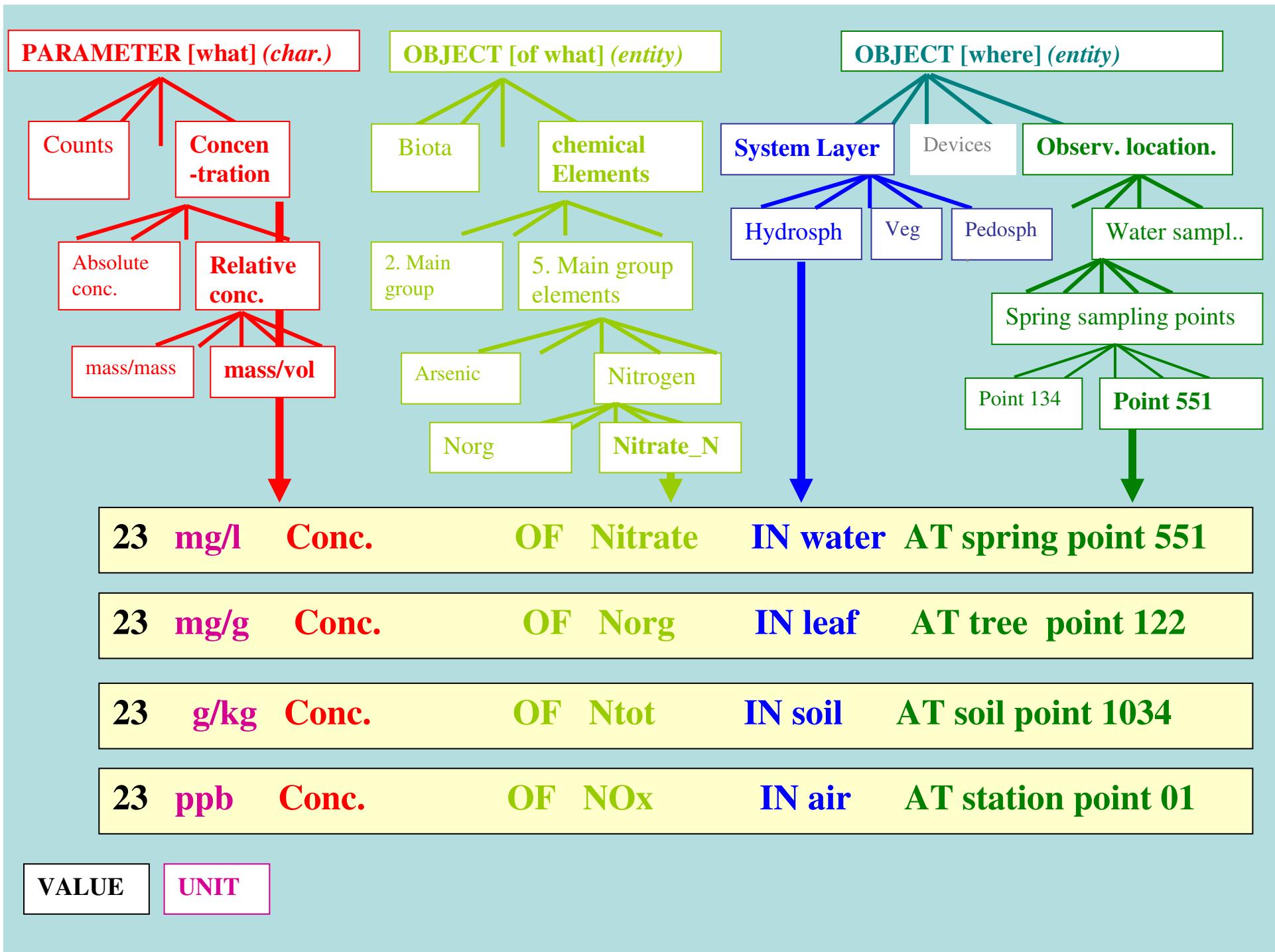
?

VALUE

UNIT









Observation

An observation is gaining information on the...

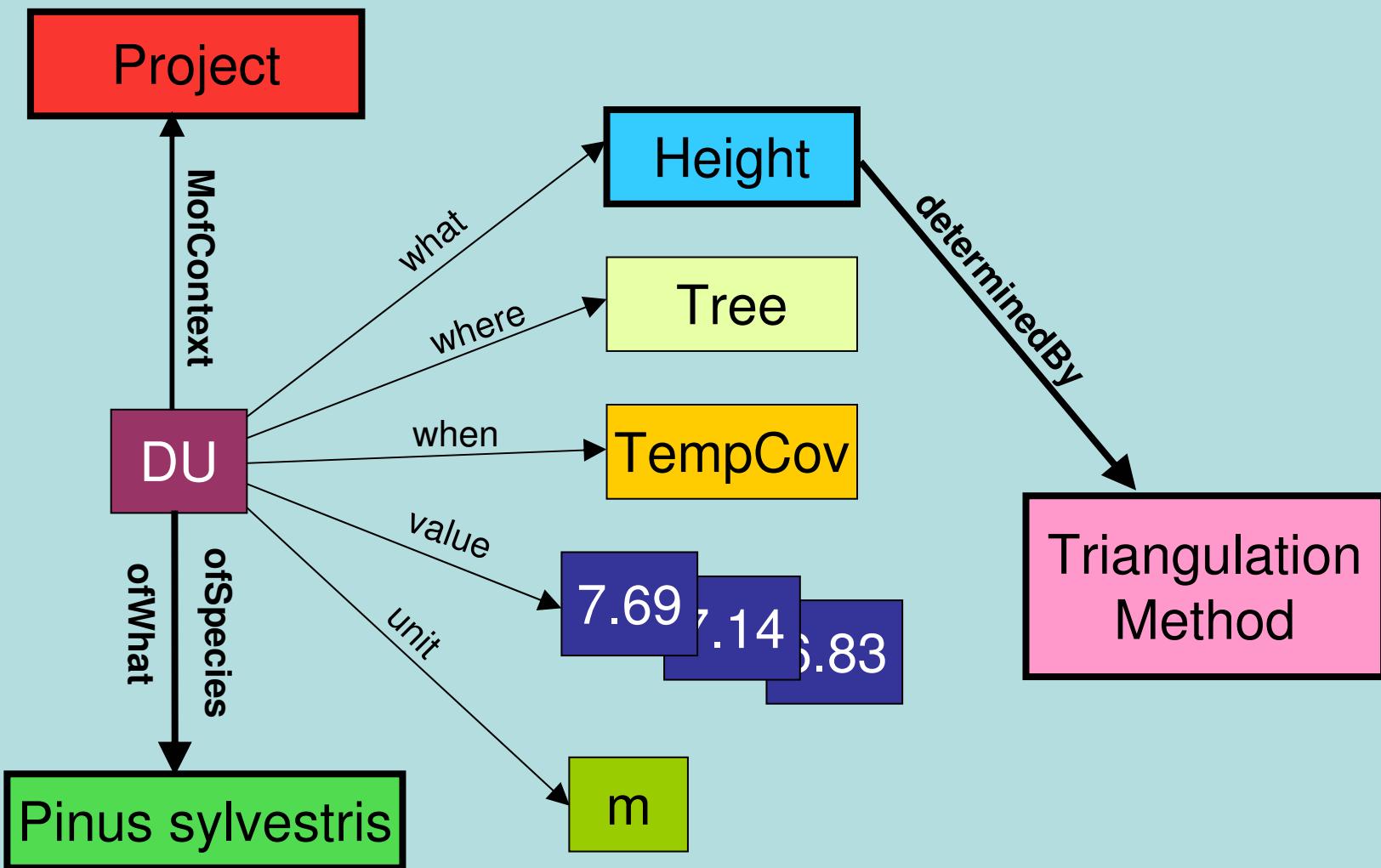
- STATUS OF a PROPERTY
- OF a MEDIUM(object)
- AT a certain LOCATION (object)
- AT given TIME(s)
- Observed by someone/-what by use of a specific METHOD
- Reported by use of and referring to related STANDARDS (unit, reference list)

In addition:

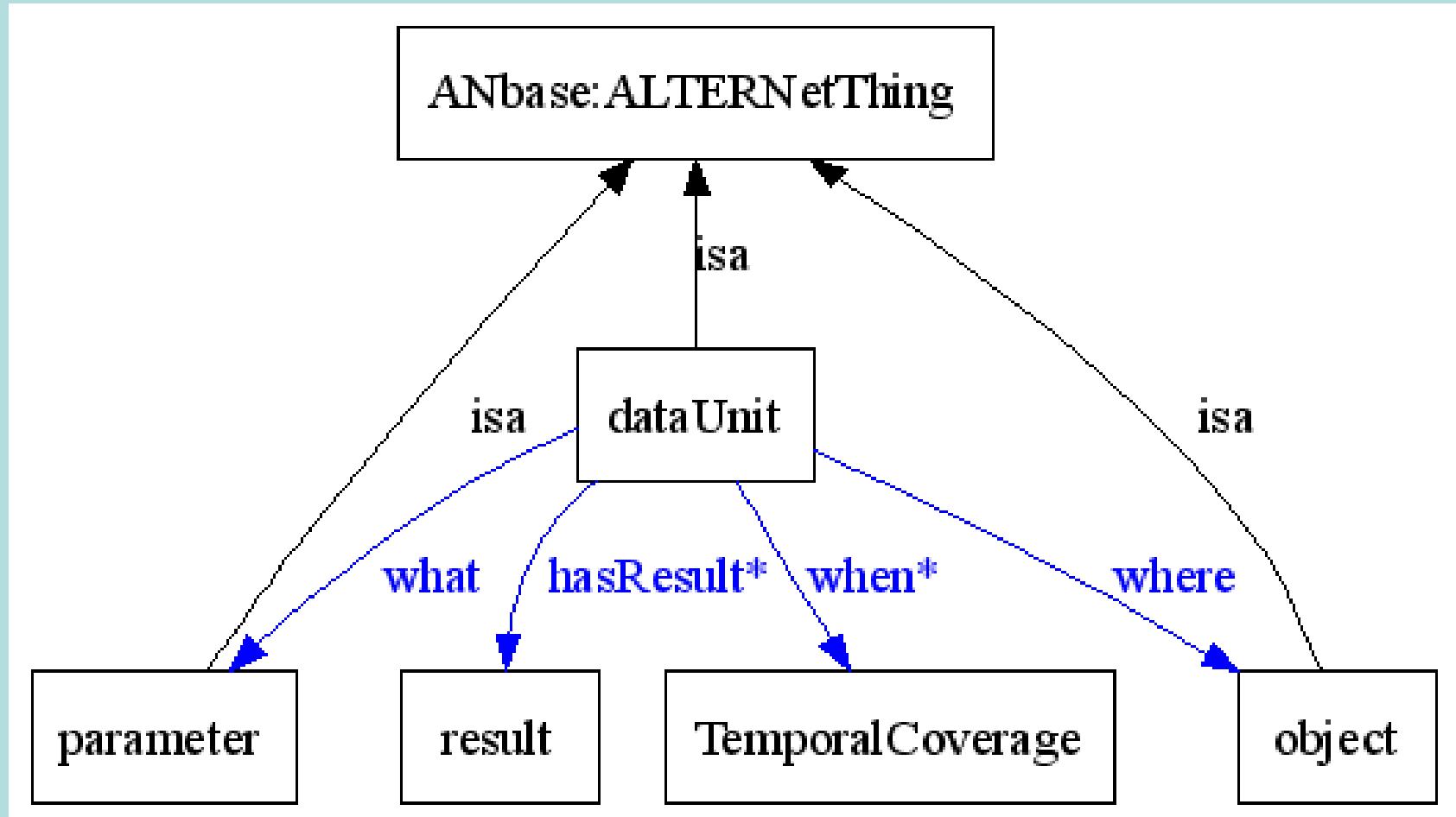
- Method provides certain quality of information (accuracy, applicability constraints = primary metainformation)
- Status observed by an observer acting in the context of a project, pulling individual measurements together
- Observation specified by other secondary metadata



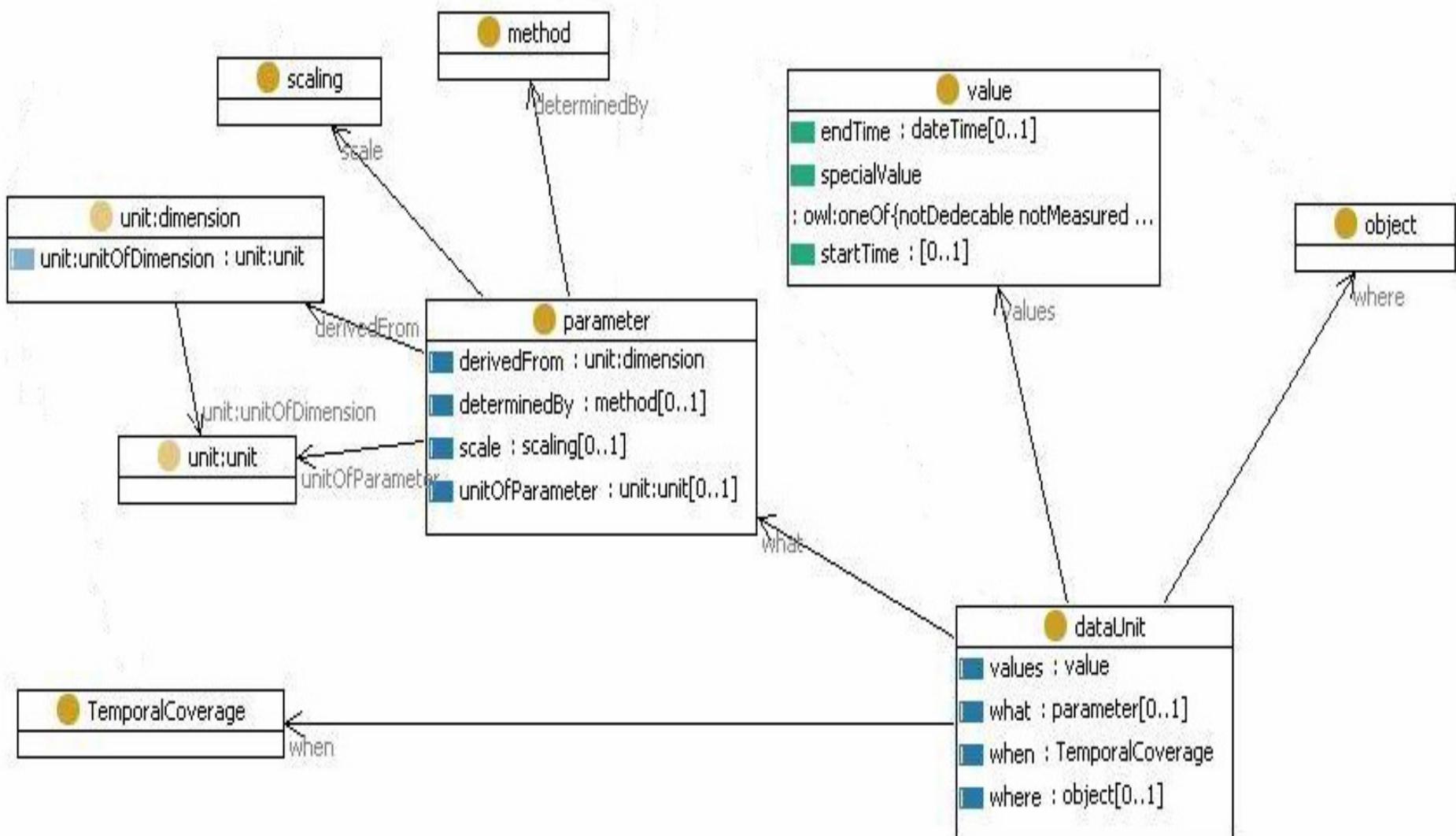
DataUnit – Classes and Relations



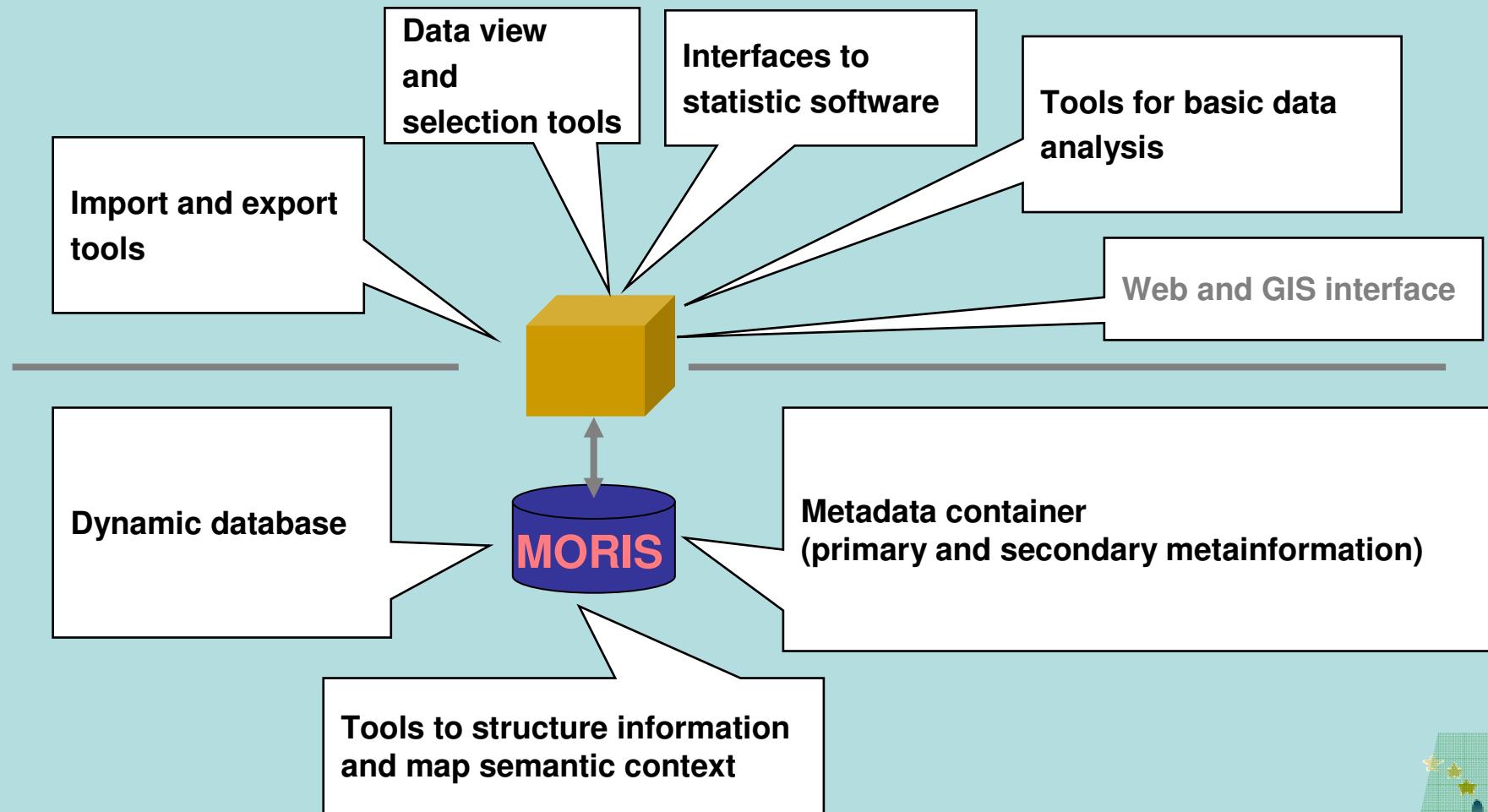
DU: Derivation hierarchy and other relations



DU: Expanding the core



Tools: MORIS 1.x, MORIS-site, MORIS 2.x

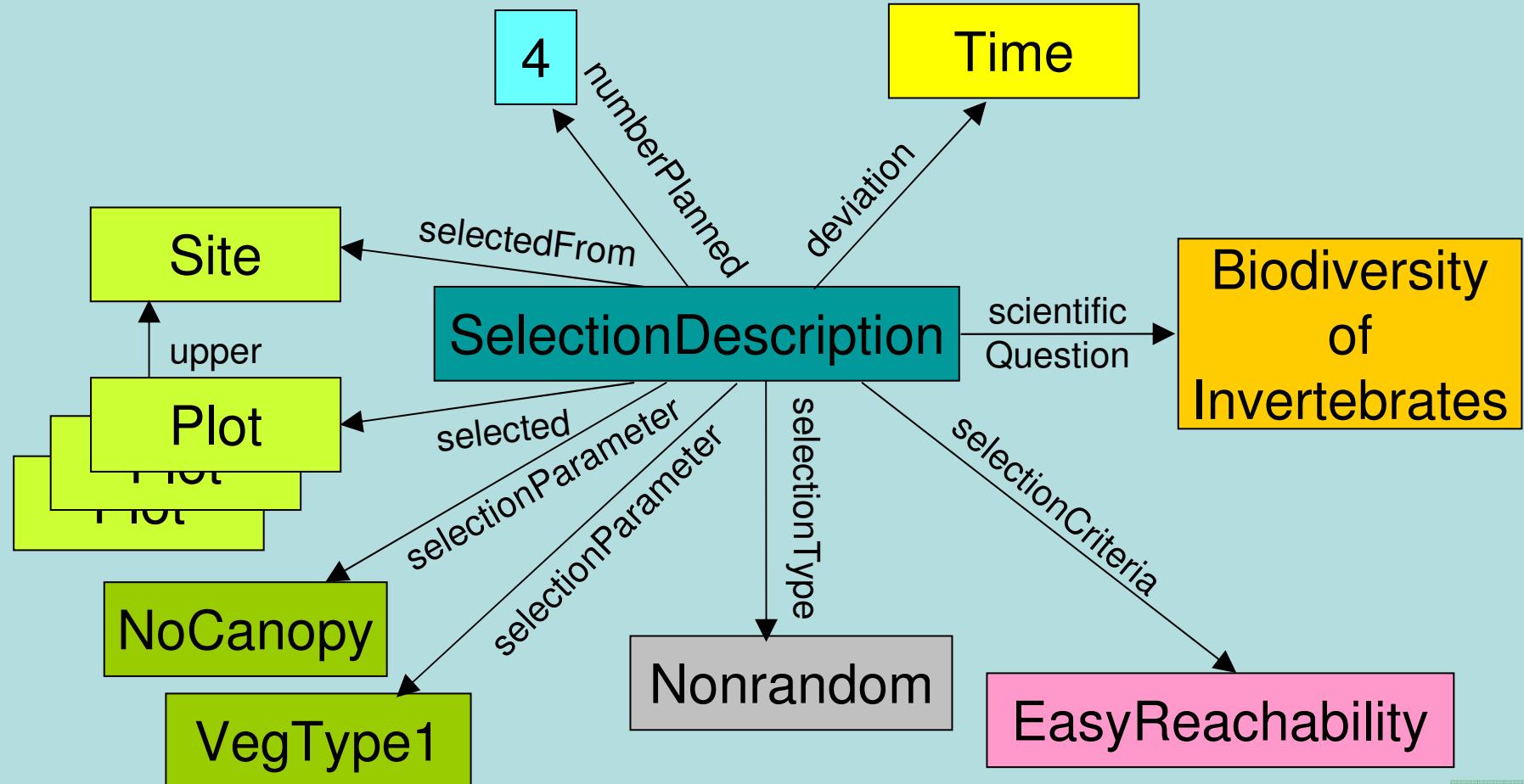


.....also: MORIS-site,future: MORIS 2.x

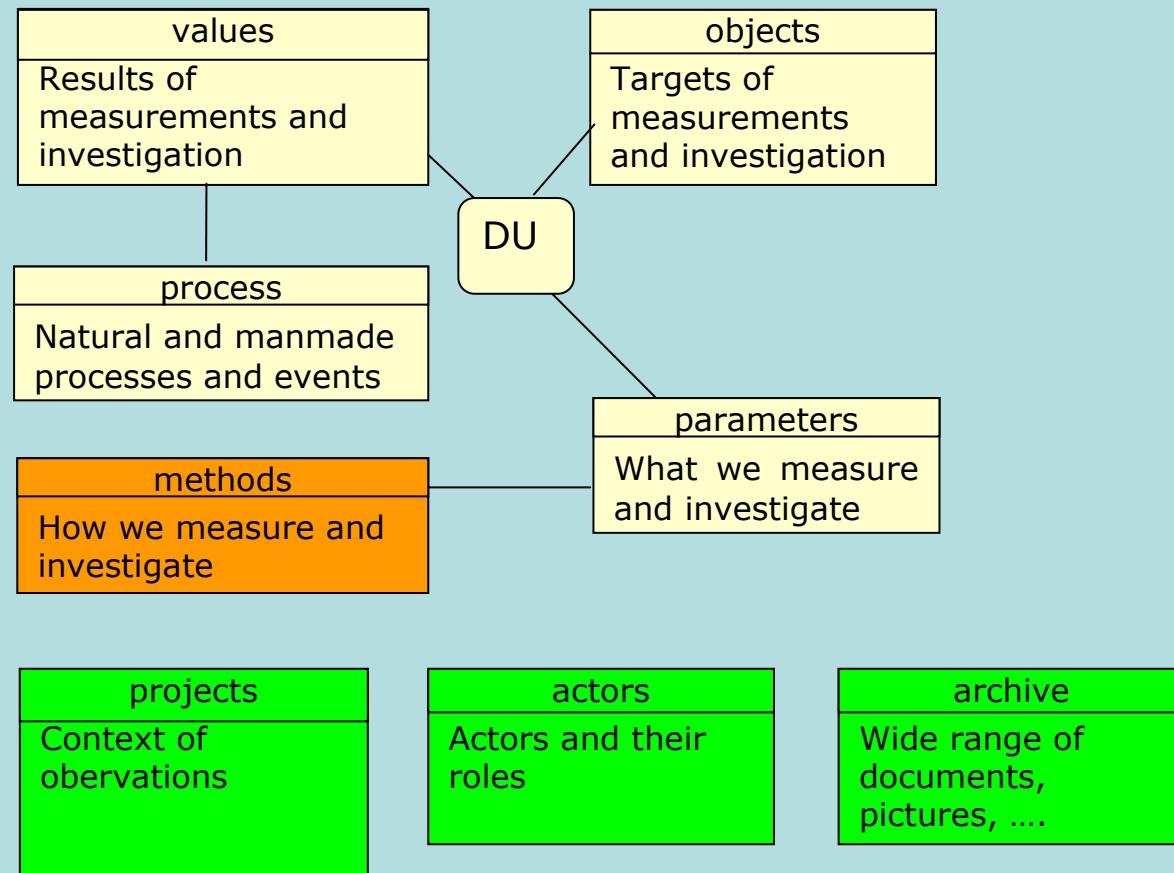


Selection Description

Scientific question driving object-object assignments

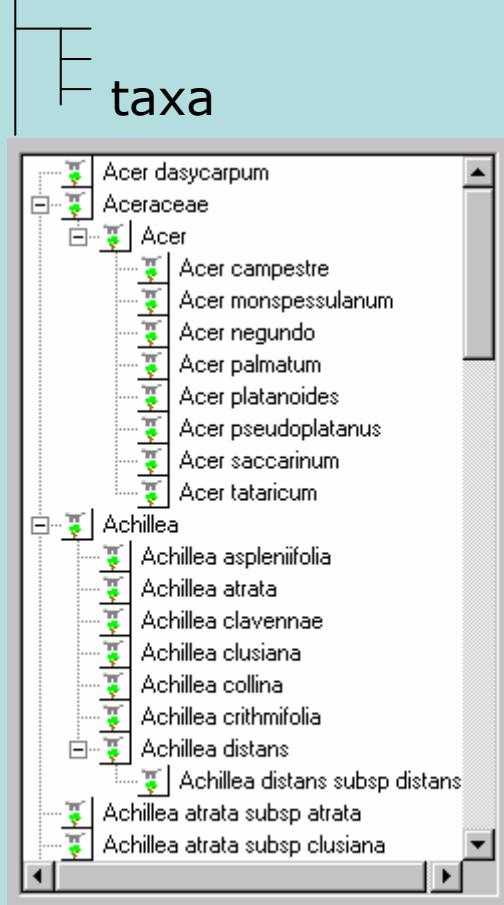


MORIS ontology

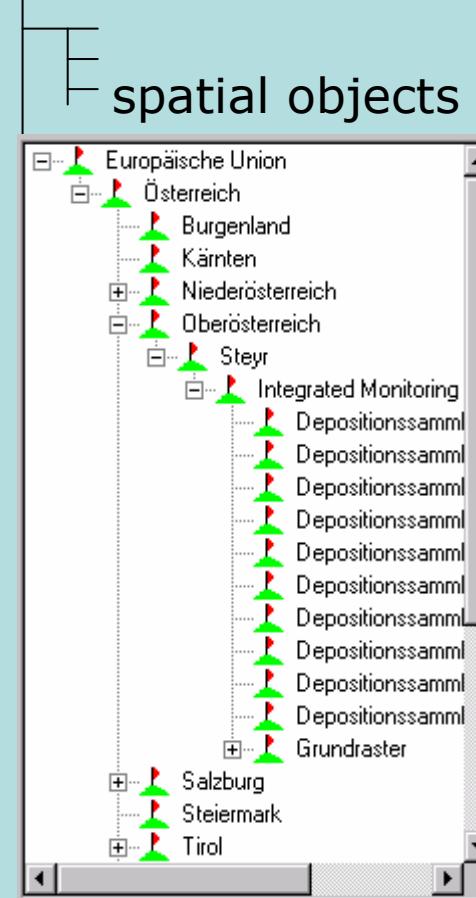


Hierarchies: structure-navigate-aggregate-retrieve

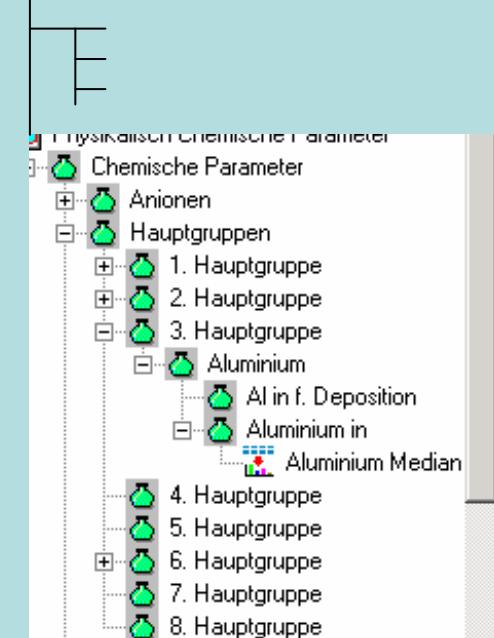
Reference lists



Objects

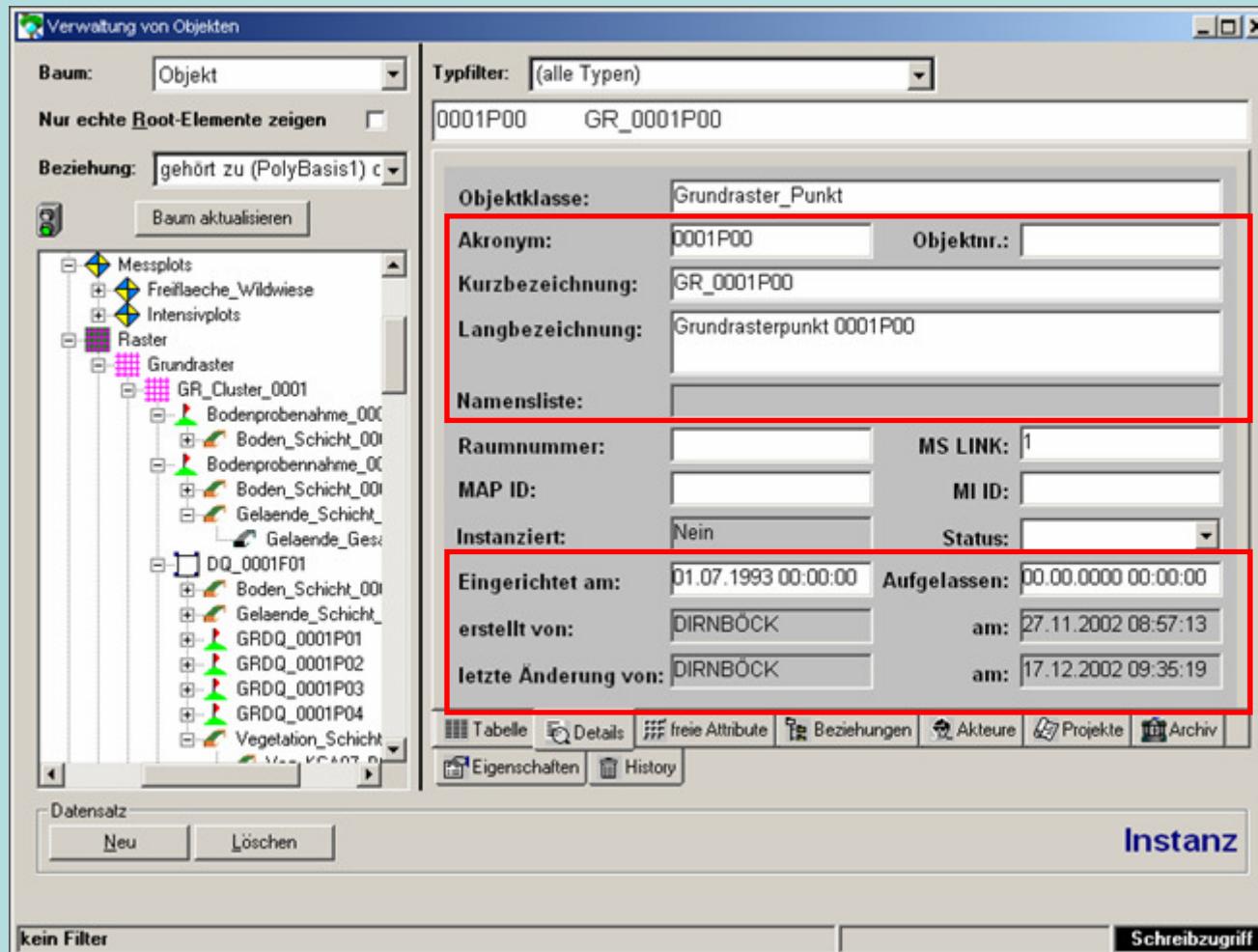


Parameters



Tree view for navigation

Standard attributes



name(s)

time of creation
time of editing

Class dependant attributes

defined by user
for e.g. spatial
references....

spatial accuracy

temporal accuracy

The screenshot shows a software interface for managing geographical data. On the left is a tree view of data structures under a root node 'Objekt'. The tree includes sections like 'Messplots', 'Raster', and 'Grundraster' with various sub-items such as 'Bodenprobenahme_001' and 'GRDQ_0001P01'. A specific record 'GR_0001P00' is selected and expanded. The main area displays a table of attributes with their values. Two rows in the table are highlighted with red boxes: 'RO_Gelaendebezeichnung' and 'Zeitangabe'. The table columns are 'Attribut', 'Wert', 'Abh.', 'Min.', and 'Max.'

Attribut	Wert	Abh.	Min.	Max.
RO_DistanzGOKIml	0	Klasse		
RO_Gelaendebezeichnung		Klasse		
RO_Genauigkeit_Distanz_GOK[D]	0	Klasse D		
RO_Genauigkeit_Fl_Grenze[dn]		Klasse		
RO_Genauigkeit_Lage[dm]	2	Klasse		
RO_Genauigkeit_Seehoehedn	2	Klasse D		
RO_Hoechwert_GK31[pm]	pausor .727	Klasse		
RO_Hoehe_bis_GOK[cm]		Klasse		
RO_Hoehe_von_GOK[cm]		Klasse		
RO_Kommentar_Vermessung	Zweifel an der Richtigke	Klasse		
RO_Mark_Sich	Vermarkt; AK	... Klasse		
RO_Qualitaet	korrekt, bestaetigt	... Klasse		
RO_Rechtswert_GK31[m]	83414.614	Klasse		
RO_Seehoehem	908.446	Klasse		
RO_Datenquelle	aarad5_1.xls	Typ		
RO_IM_Raumcode_Geo	Punkt	... Typ		
RO_IM_Raumcode_RaumNr	1	Typ		
RO_IM_Raumcode_TeilNr	00	Typ		
RO_Topo_Aenderung	nein	... Typ		
Zeitangabe	Code	... Typ		
Loeschen		Unabh.		

Methodological design – hierarchy & sequence

Verwaltung von Methodenanwendungen

Baum: Methodenanwendung ▾

Nur echte Root-Elemente zeigen

Baum aktualisieren

Master für Methodenverwaltung

- unbedeutend
- Schwermetalluntersuchung an Moosen
 - Standortauswahl Moose
 - Probennahme Moose
 - Transport Moose
 - Probenaufbereitung Moose
 - Trocknung von Moosen
 - Reinigung der Moose im Labor
 - flächenbezogene Aufbereitung
 - Aufschluß Moose
 - Perchlorsäureaufschluß der Moose
 - Analyse der Moose mittels AAS
 - Atomabsorptionsspektrometrie f. Arsen in
 - Analyse der Moose mittels ICP - AA
 - Analyse der nassen Deposition
 - Auswertung der nassen Deposition

Fensterverwaltungen öffnen

sequence

TRMOOS Trocknung von Moosen

Daten Primäre Metainformation

Akronym: TRMOOS Meth.-Design: Ja

Kurzbezeichnung: Trocknung von Moosen

Langbezeichnung:

Methode: Trocknung der Probe

Meth.anw. davor: Transport von Moosen

Methodenast: Probenaufbereitung Moose

Zeitabbildung: diskontinuierlich und Anw.-Typ differenzieren

Erheblich: Ja Instanziert: Nein

vergeben am: 09.03.2001 12:59:32 aufgelassen: 00.00.0000 00:00

erstellt von: SCHENTZ am: 09.03.2001 12:59

Tabelle Details Beziehungen Akteure Projekte Archiv Umrechnung

Objekt(klassen) History

Neu Löschen Kopieren

kein Filter Status: frei Schreibzugriff

Standard interface for different contents

Natural Processes:
Floods, dry Periods, ... in „MEDEA“

Beziehung: gehört zu

Baum aktualisieren

Attribut Wert

bis	
Dauer [h]	
Einzugsgebiet [km ²]	
genauigkeit des Datums	Jahr
Geschiebe Führung alt	
Geschiebe Führung neu	
Geschiebe Herkunft	
Geschiebherkunft	
von	
Wiederholungswahrscheinlichkeit	
Zeit [h]	

Attributwerte von Namensserver holen...

Tabelle Details freie Attribute

Datenpunkte Geräte Werte

Men driven Processes:
Sampling, campaigns,

Beziehung: gehört zu (polyhierarchisch)

Baum aktualisieren

Akronym: MOSS

Kurzbezeichnung: Aufsa...

Langbezeichnung:

Codeteam:

Codeprojekt:

Charge:

Probenklasse: Moos...

Namensliste:

Probennummer 1:

Probennummer 3:

Blindprobe:

Übernahme: 00.00.

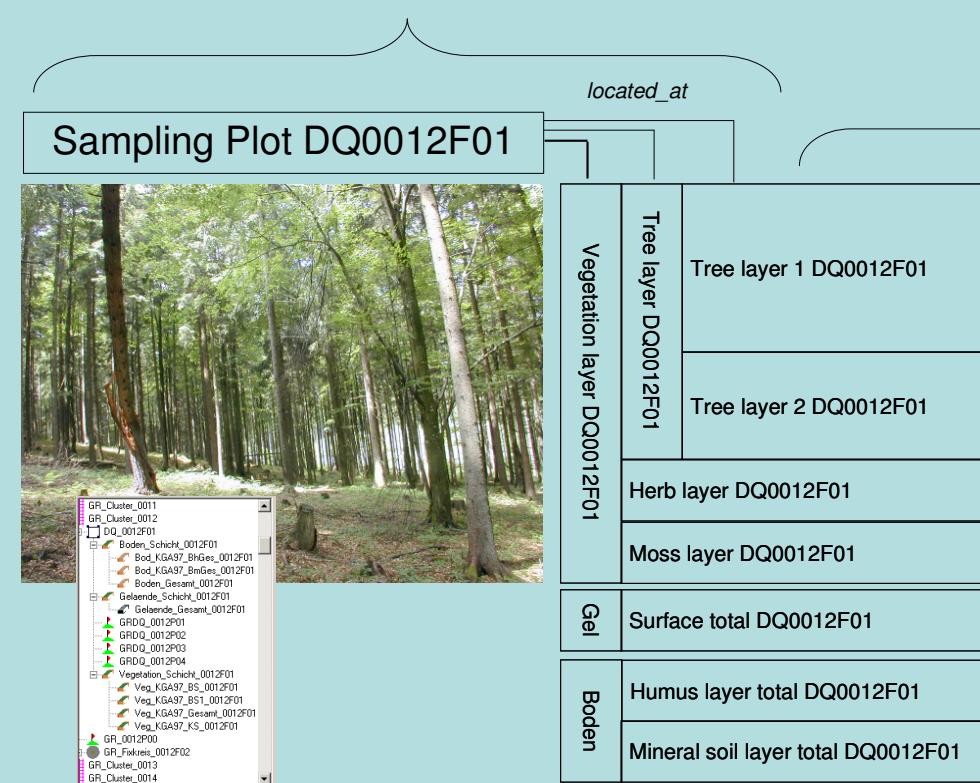
Tabelle Details freie...

Datenpunkte Geräte Werte

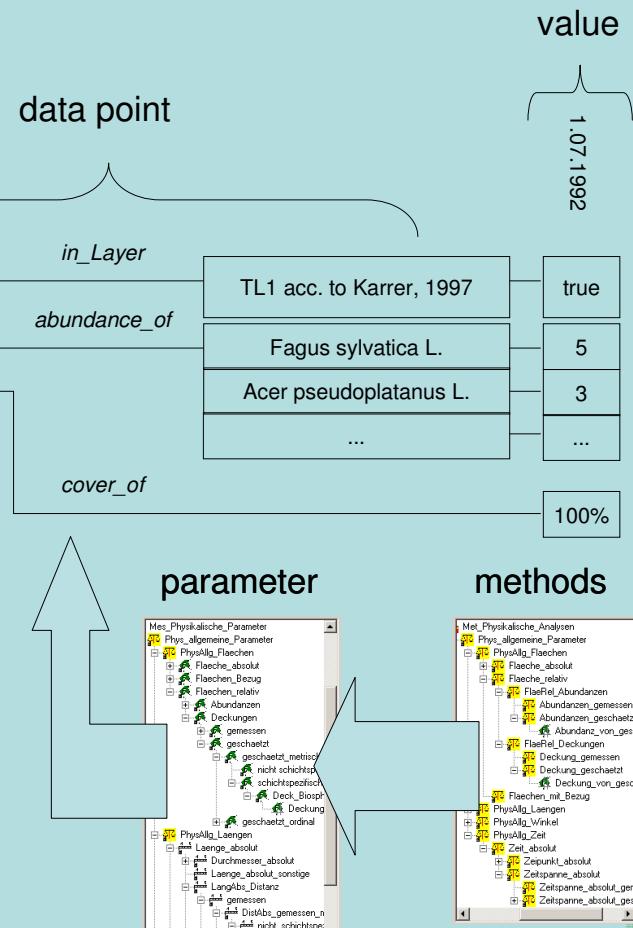
Example of data structure

Example of data representation

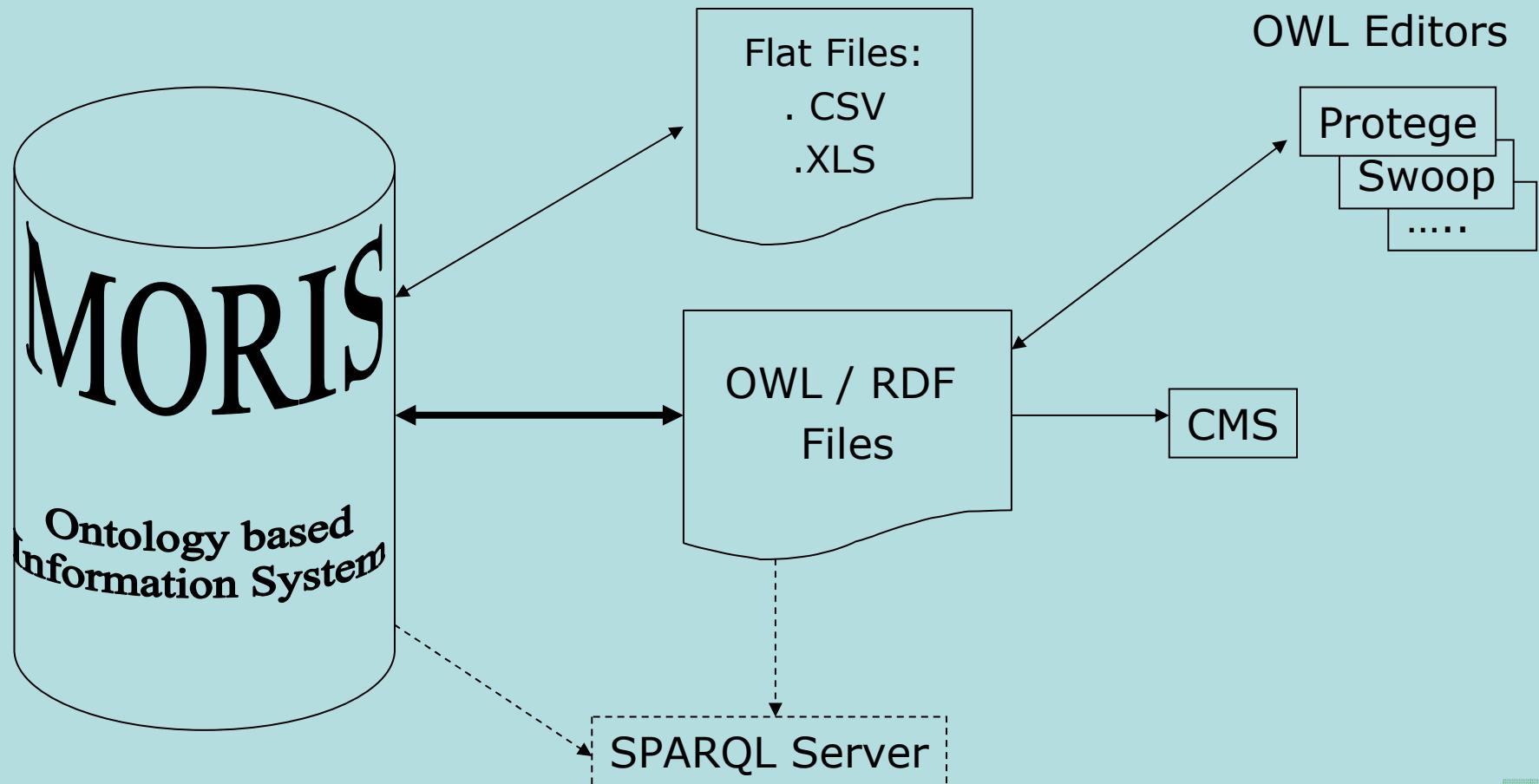
spatial object



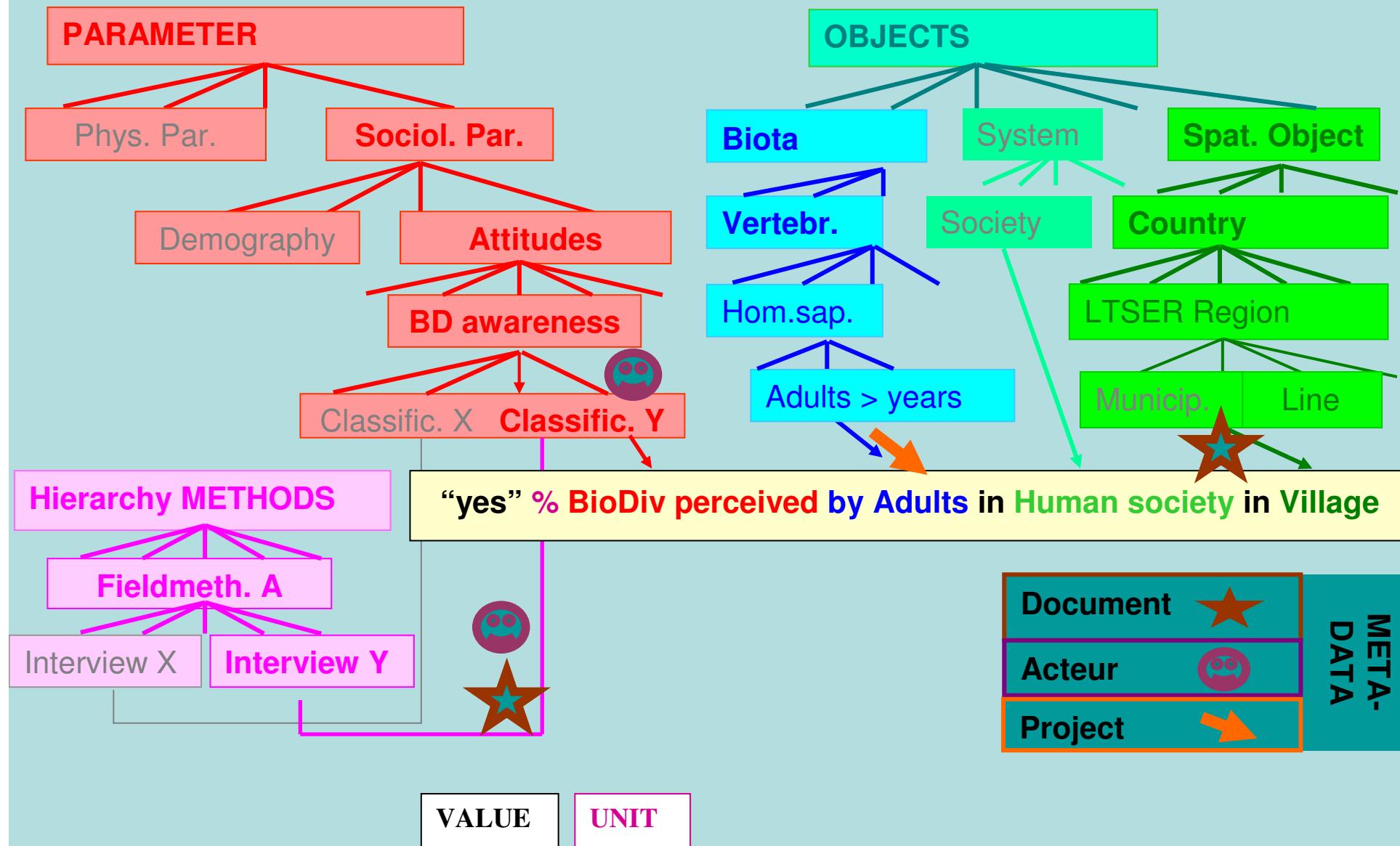
Vegetation survey at sampling plot 0012



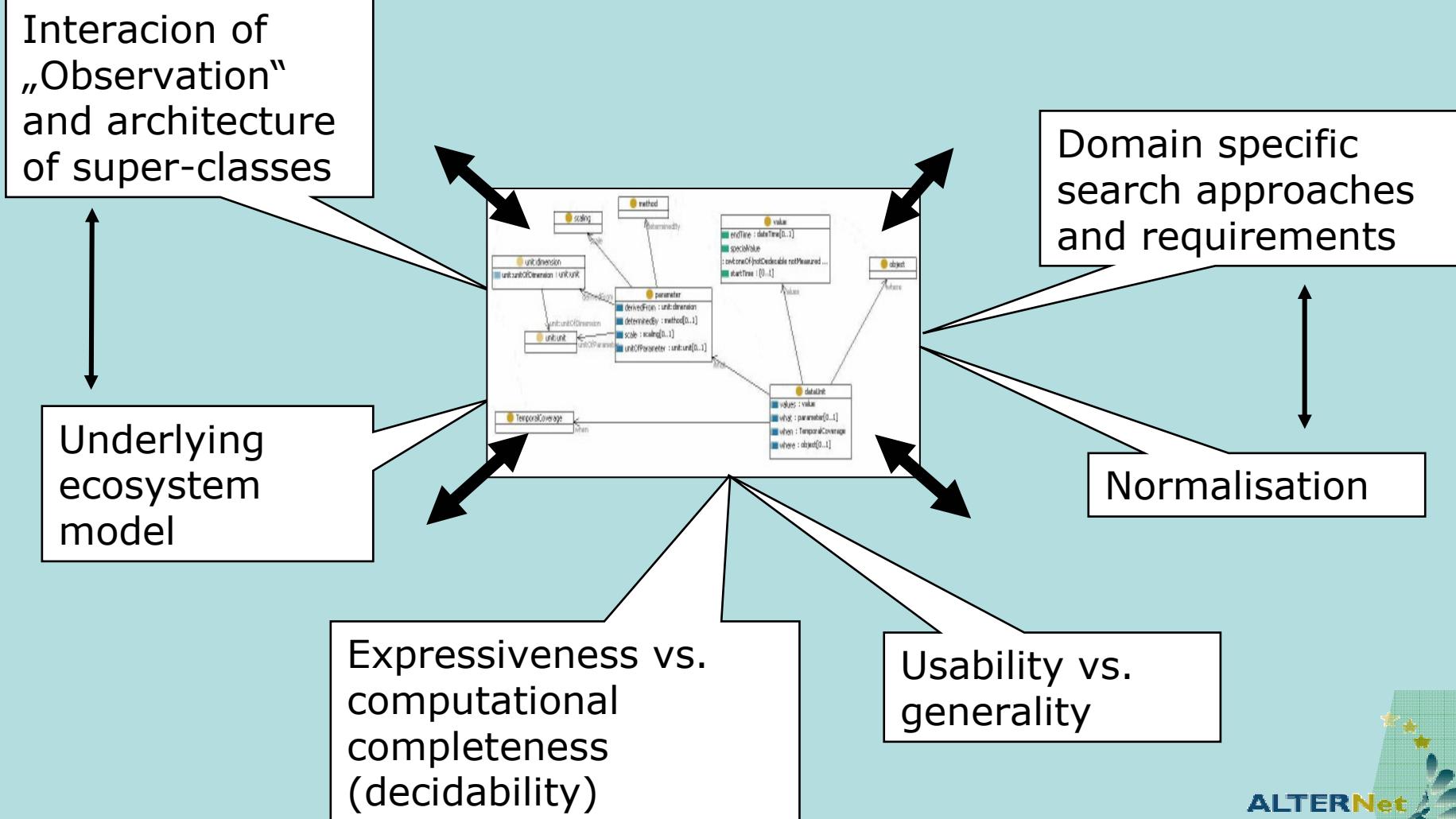
Exchange OWL – DL files



MORIS = testing extensibility e.g. towards socio-ecological data



The crux (or curces!!) of expansion



**you made
it!**

**THIS IS
THE END**

