Introduction to Georeferencing

12 May 2016, Cape Town, South Africa
Purpose?

- Spatial data analysis, e.g. distribution mapping
- Linking of (specimen) data with the type of geographical data that defines a record in space.
- In biodiversity collections, this geographical data usually starts off as a locality text string.
INSTITUTO DE INVESTIGAÇÃO CIENTÍFICA DE ANGOLA
HERBÁRIO (LUAI)

(Umbelíferas)

Era rizos do 60 cm. 
Aqui e ali, no largo
Secundário dos arredores
da cidade.

COL. P. R. Correia no 2825
AVG, HUILA, SA "DS Bandeira Palhares
25/IV/1965
What is georeferencing?

► In addition to a text string; grid or coordinate data may also have been recorded.

► Such grid or coordinate data can be used by a computer to map a point.

► In contrast, when the grid or coordinate data is absent, retrospective georeferencing is done after the collection event.

► Retrospective georeferencing essentially translates the locality text string into a format that can be plotted on a map.
Heteromorpha sp. cf. gossweileri (C.Norman) C.Norman

Angola, Huila Province:
Huila Plateau:
High altitude grassland of Serra da Chela.
Watershed E of Estacao Zootecnica.

Suffrutex, branching profusely at ground level.

Det: P.J.D.Winter  February 2009
**FLORA OF SOUTHERN AFRICA**

*Pseudanum platycarpum* E. Mey. ex Sond.

South Africa, Natal.
Weza State Forest.
Ngele Mountain
Kwa-Shwili Area.

**ALT.:** m

**HABITAT:** Grassland.
Between rocks.

**NOTES:** Erect perennial herb.
Flowers yellow.

**COLL.:** A.E. van Wyk

**COLLECTED ON:** 24/11/1994
**DET.:** PRE

**NO.:** 12538

**FILING:**
Family: 250 UMB GENSPEC.: 6116.000-02300
PRU number: 078041. Genus / Species: 6116 / Special Collection(s): Ngele
BOTSWANA:
Goodhope.
21-28.ii.1990
J.M. Mashonja
Not very precise, although accurate
What is a Georeference?

Atherigona (Atherigona) soccata Rondani

det. B.S. Muller, 2011

33°58'58"S 18°25'50"E

3318CD

Kirstenbosch National Botanical Gardens

RSA: Western Cape Cape Town, Kirstenbosch National Botanical Gardens 3318CD, Date: 13.vi.1976 Coll.: J. Smith
An ideal georeference?
What is a Georeference?

Coordinate precision?

Datum?

Extent & Uncertainty
25.474151°S 25.431891°E

Extent: 3.97 km
Maximum uncertainty
4.971 km
Why georeferencing?

Occurrence data are potentially the most widely or frequently applied data from biological collections, because:

► digitized specimen data are put in a geographical context.
► they facilitate finding populations in the field.
► they facilitate visualization of species ranges.
► they facilitate the application of many useful tools, from species dot maps to full GIS analyses.

(John Elia, Trainer, Tanzania 2010)
Why georeferencing?

Once we can apply data in this way, we can use the derived information for a host of research and decision support purposes:

- Conservation Planning.
- Environmental management.
- Vegetation analysis.
- Presentation of taxonomic research output.
- Biodiversity monitoring.
How do we georeference specimen data?