EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN

FACULTY OF
SCIENCE

HEIDELBERGER AKADEMIE
DER WISSENSCHAFTEN

Rekonstruktion pleistozäner Uferlinien des Lake Manyara (Tanzania) mittels Fernerkundung

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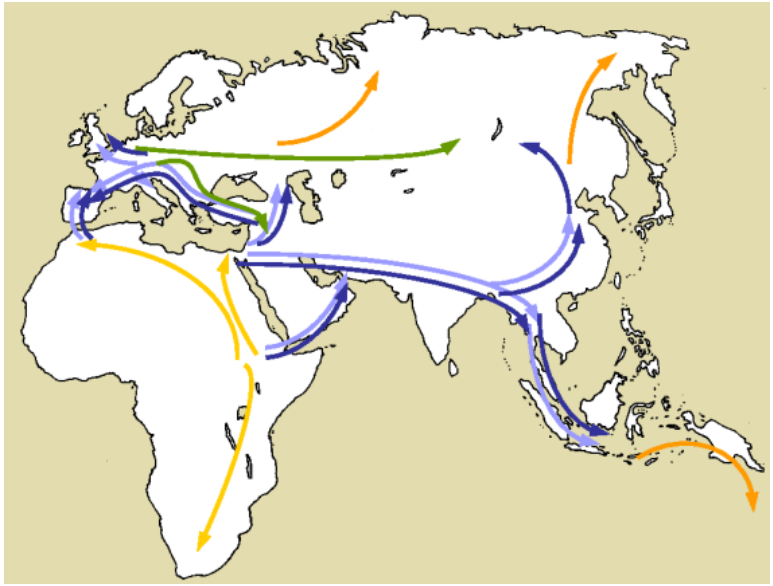
Department of Geography

The ROCEEH project

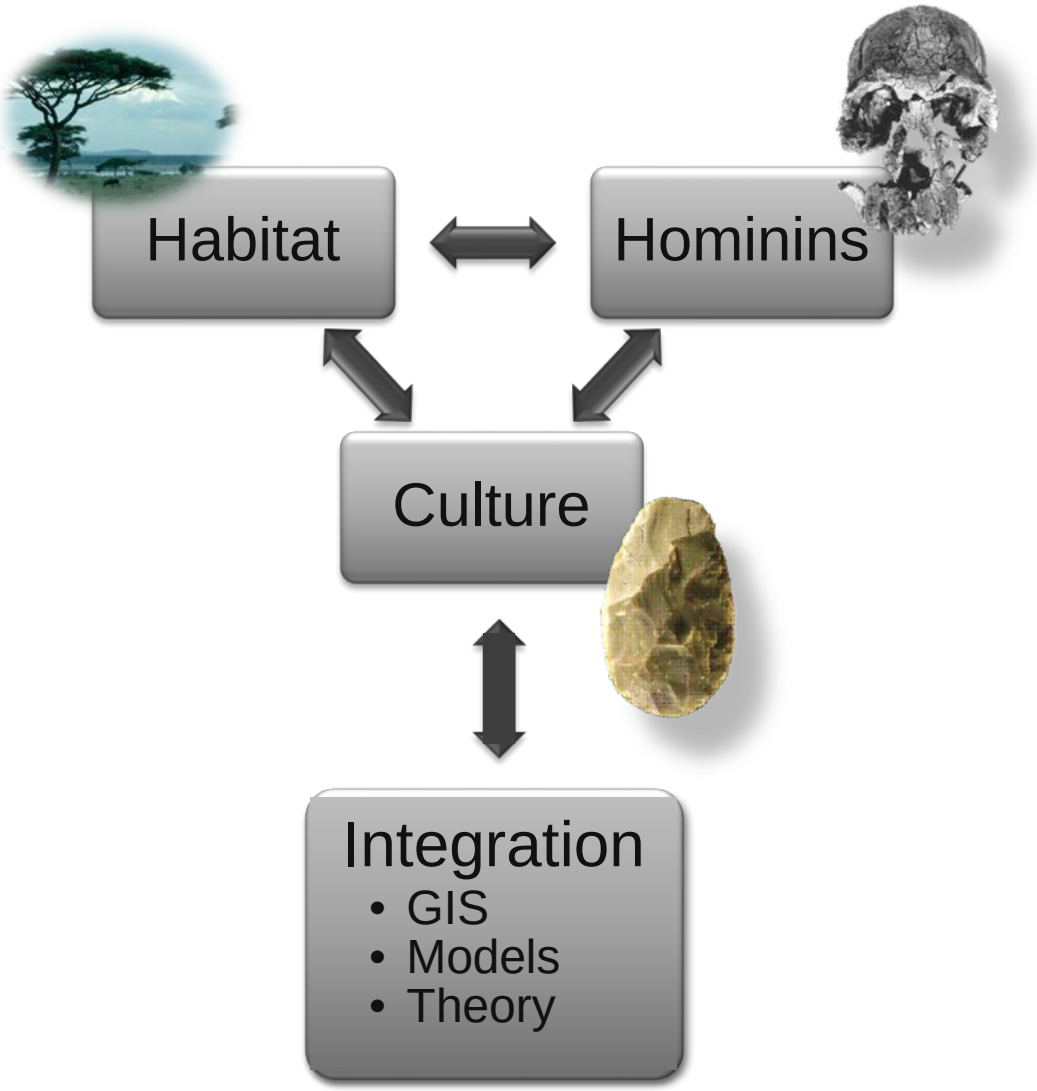
Spatial expansion:

- of habitats
- of organisms
- of artefacts



Expansion of behavioral potential:

- biological
- cognitive
- cultural



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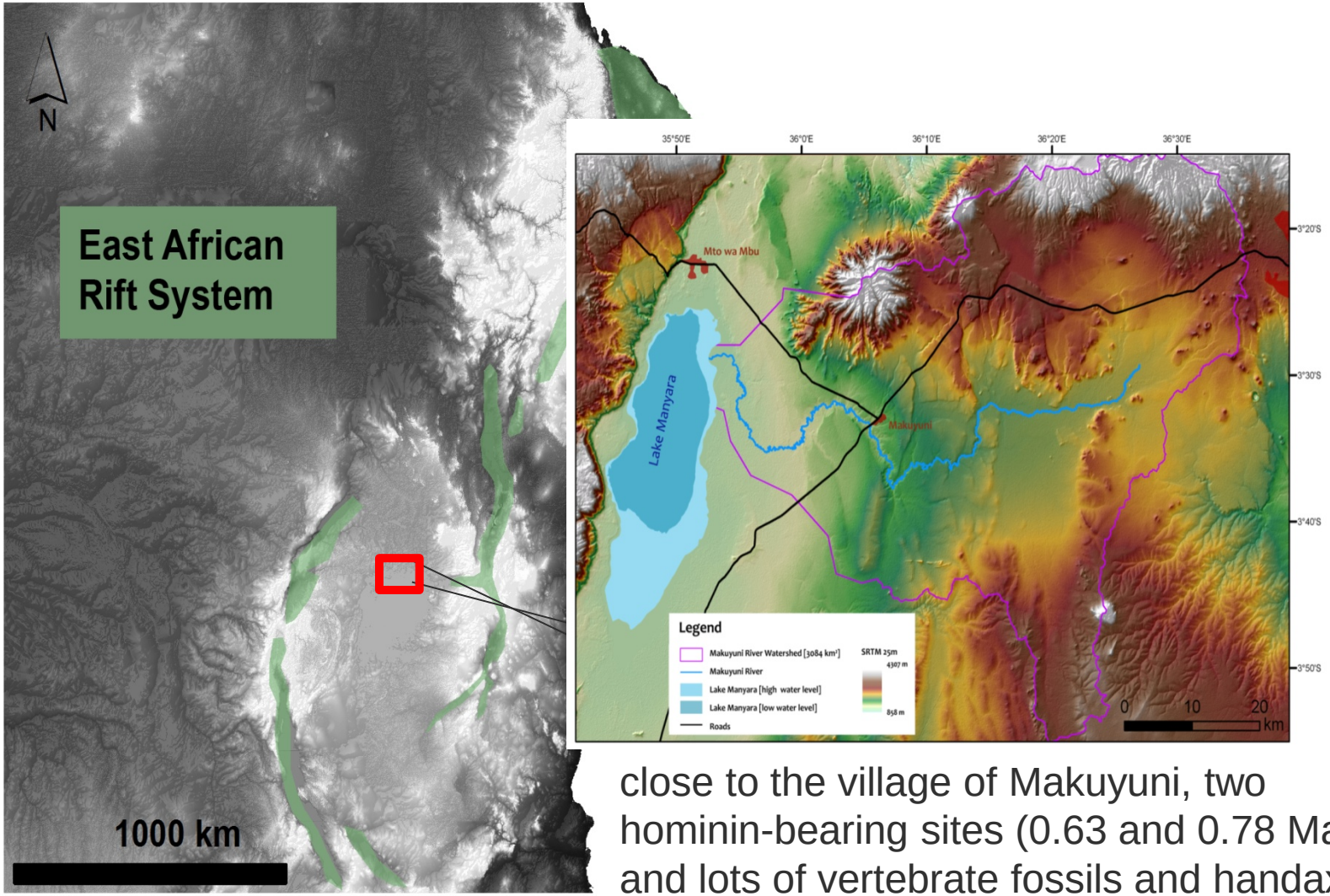

close to the village of Makuyuni, two hominin-bearing sites (0.63 and 0.78 Ma) and lots of vertebrate fossils and handaxes from different periods were found

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Existing datings from published literature

Authors	Methods	Age / years
Casanova & Hillaire-Marcel 1992	C14 and U/Th (stromatolites)	Ca. 25,000
Casanova & Hillaire-Marcel 1992	C14 and U/Th (stromatolites)	Ca. 90,000
Schwartz et al. 2012	40Ar/39Ar (tuffs)	Ca. 633,000

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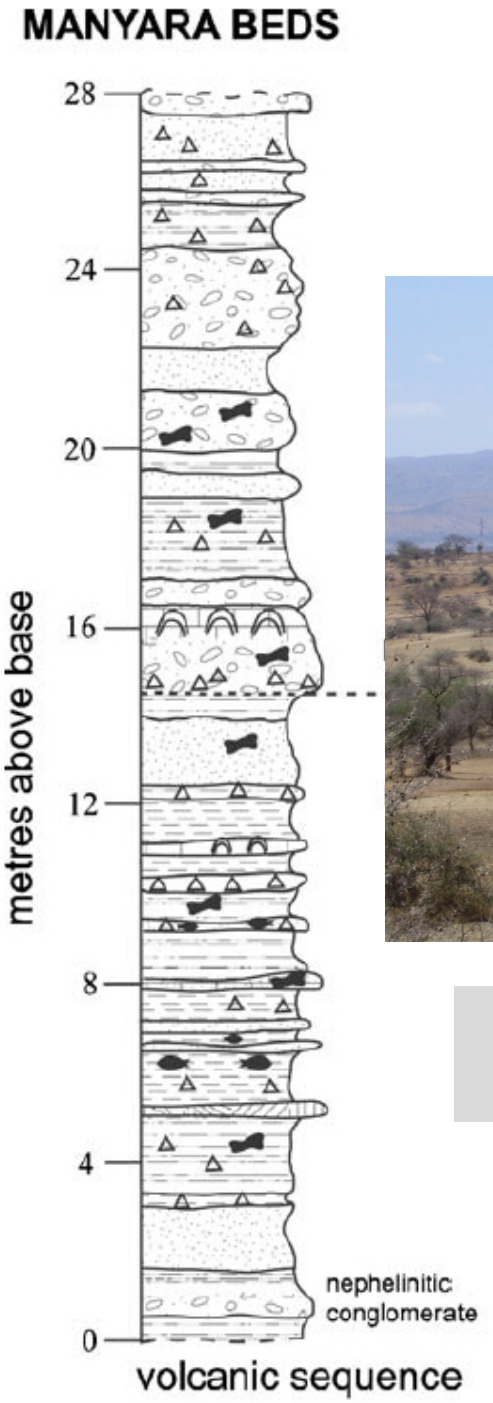

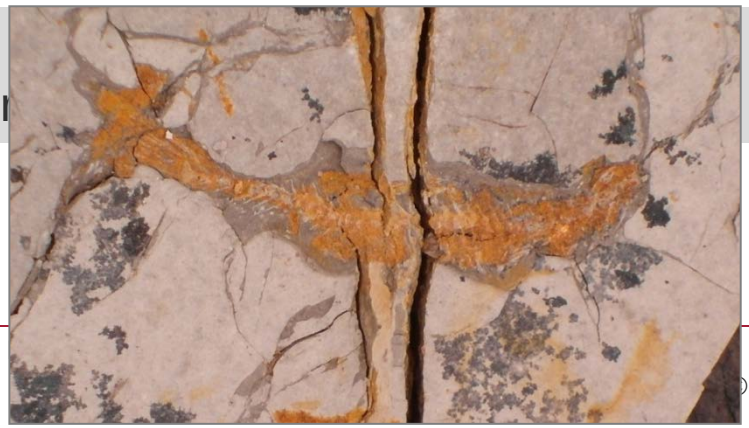

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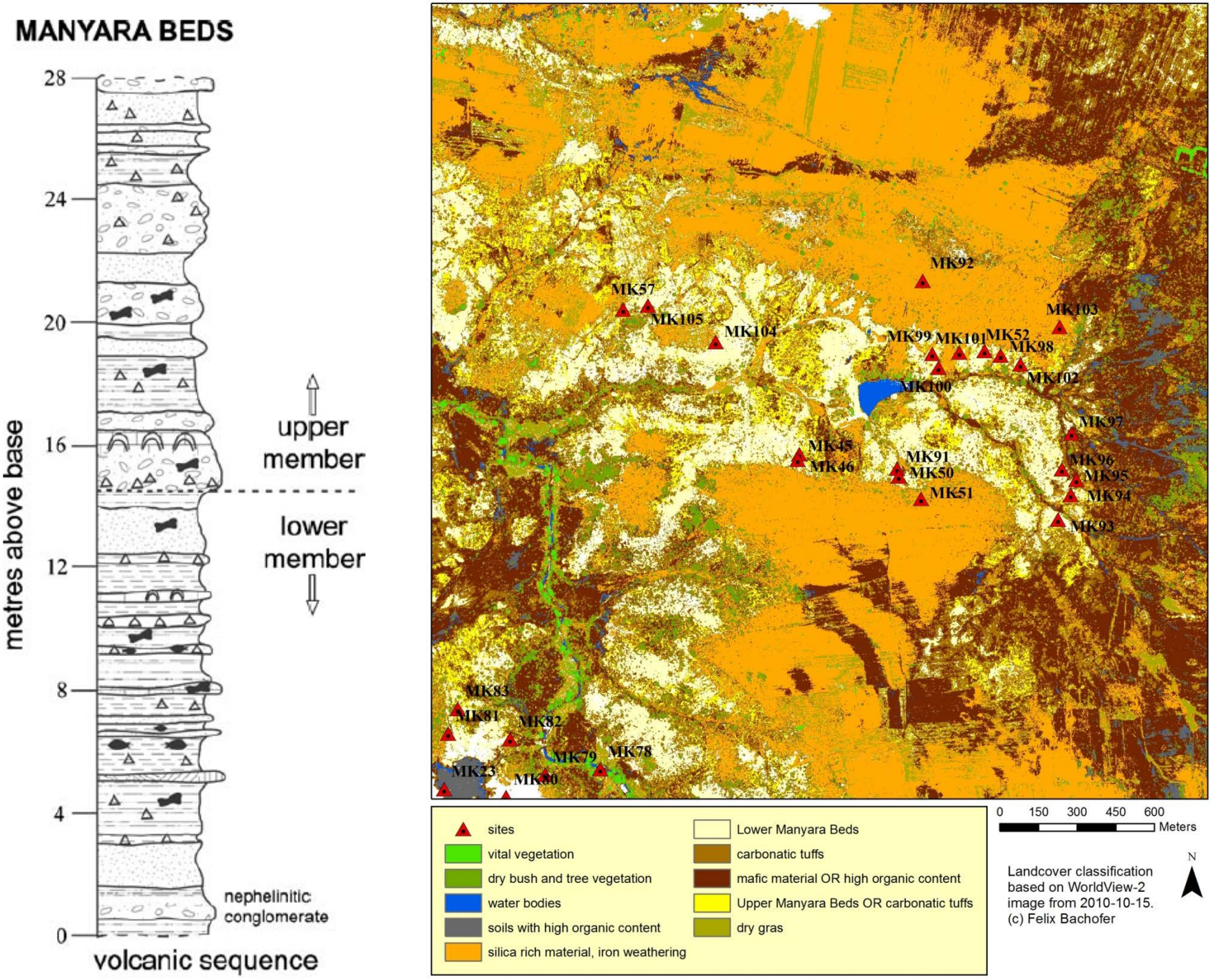
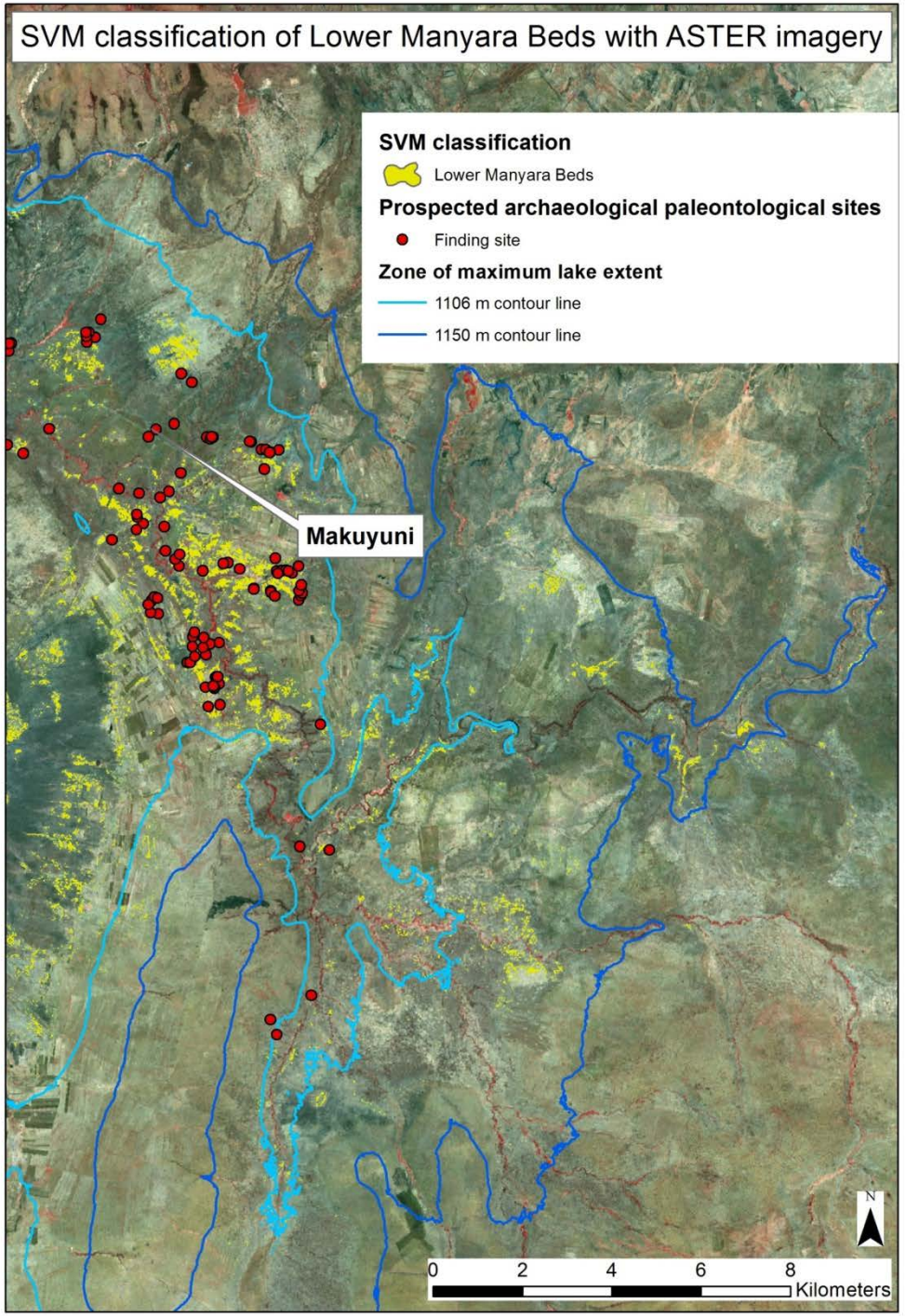

MANYARA BEDS
28
24
20
16
12
8
4
0
metres above base
upper member
lower member
nephelinitic conglomerate
volcanic sequence
MK92
MK57
MK105
MK104
MK103
MK99
MK101
MK52
MK98
MK102
MK100
MK97
MK45
MK46
MK91
MK50
MK96
MK95
MK51
MK94
MK93
MK83
MK81
MK82
MK79
MK78
MK23
MK80
sites
vital vegetation
dry bush and tree vegetation
water bodies
soils with high organic content
silica rich material, iron weathering
Lower Manyara Beds
carbonatic tuffs
mafic material OR high organic content
Upper Manyara Beds OR carbonatic tuffs
dry gras
0 150 300 450 600
Meters
N
Landcover classification based on WorldView-2 image from 2010-10-15. (c) Felix Bachofer


SVM classification of Lower Manyara Beds with ASTER imagery
SVM classification
Lower Manyara Beds
Prospected archaeological paleontological sites
Finding site
Zone of maximum lake extent
1106 m contour line
1150 m contour line
Makuyuni
N
0
2
4
6
8
Kilometers

Stromatolites, oncolites and paleo-shoreline

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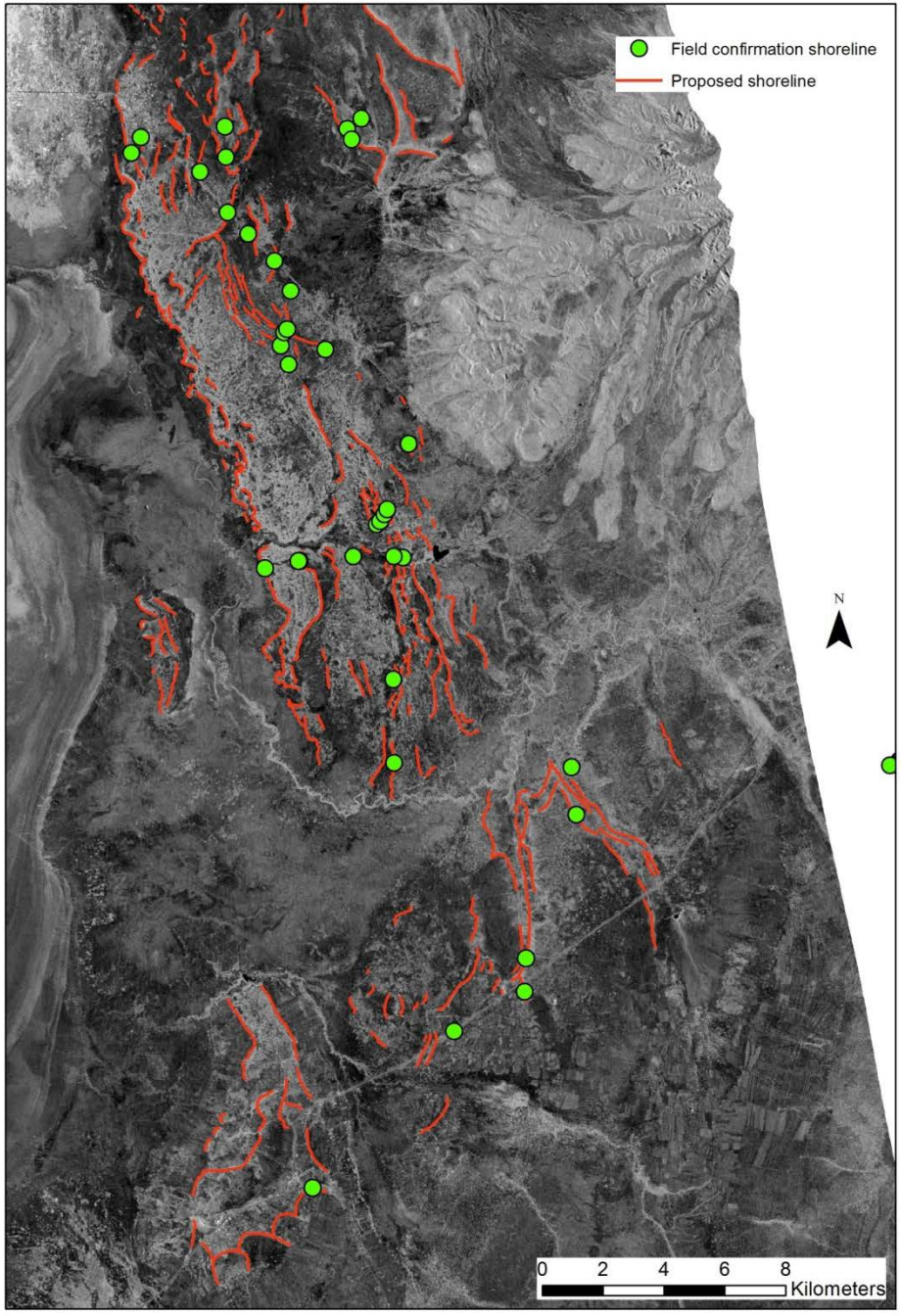
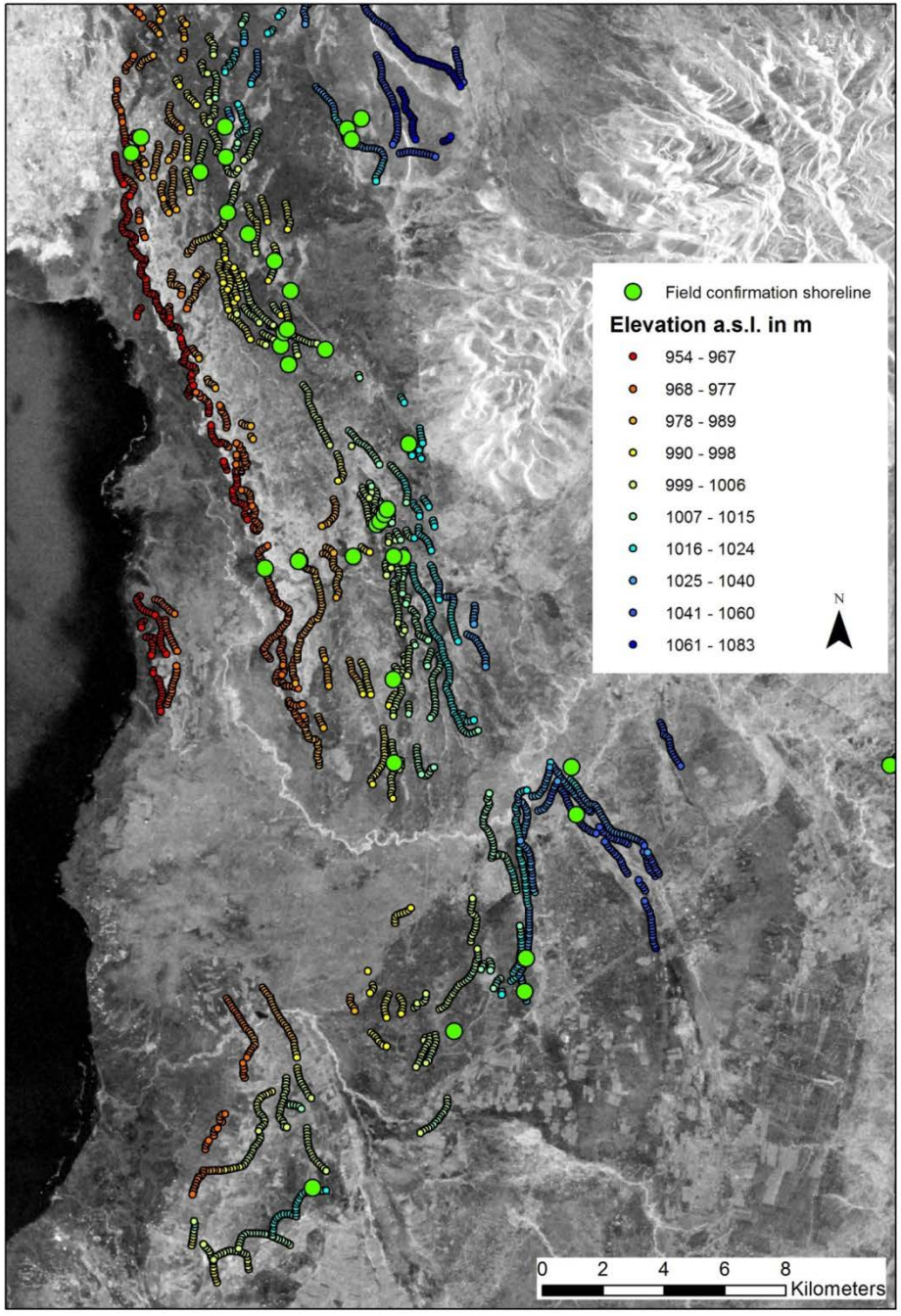


TerraSAR-X StripMap (HH; σ^0) 2011-09-11;
Ascending; right looking



ALOS PALSAR (HH; σ^0) 2008-05-24

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Conclusions

- Data integration from DEMs, RS and fieldwork is very useful and leads to additional information for archaeological site distribution and lake extent analysis
- SAR data proved to successfully delineate morphological distinct forms
- Datings of stromatolite samples will be compared with datings from adjacent Lake Natron
- Lake level fluctuations in the Pleistocene can be detected and will be correlated with climate reconstruction analysis from East Africa

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Thank you.

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