



Remote Sensing of Vegetation

Part II – examples

Thomas Gumbricht,
www.mapjourney.com

Remote Sensing of Vegetation

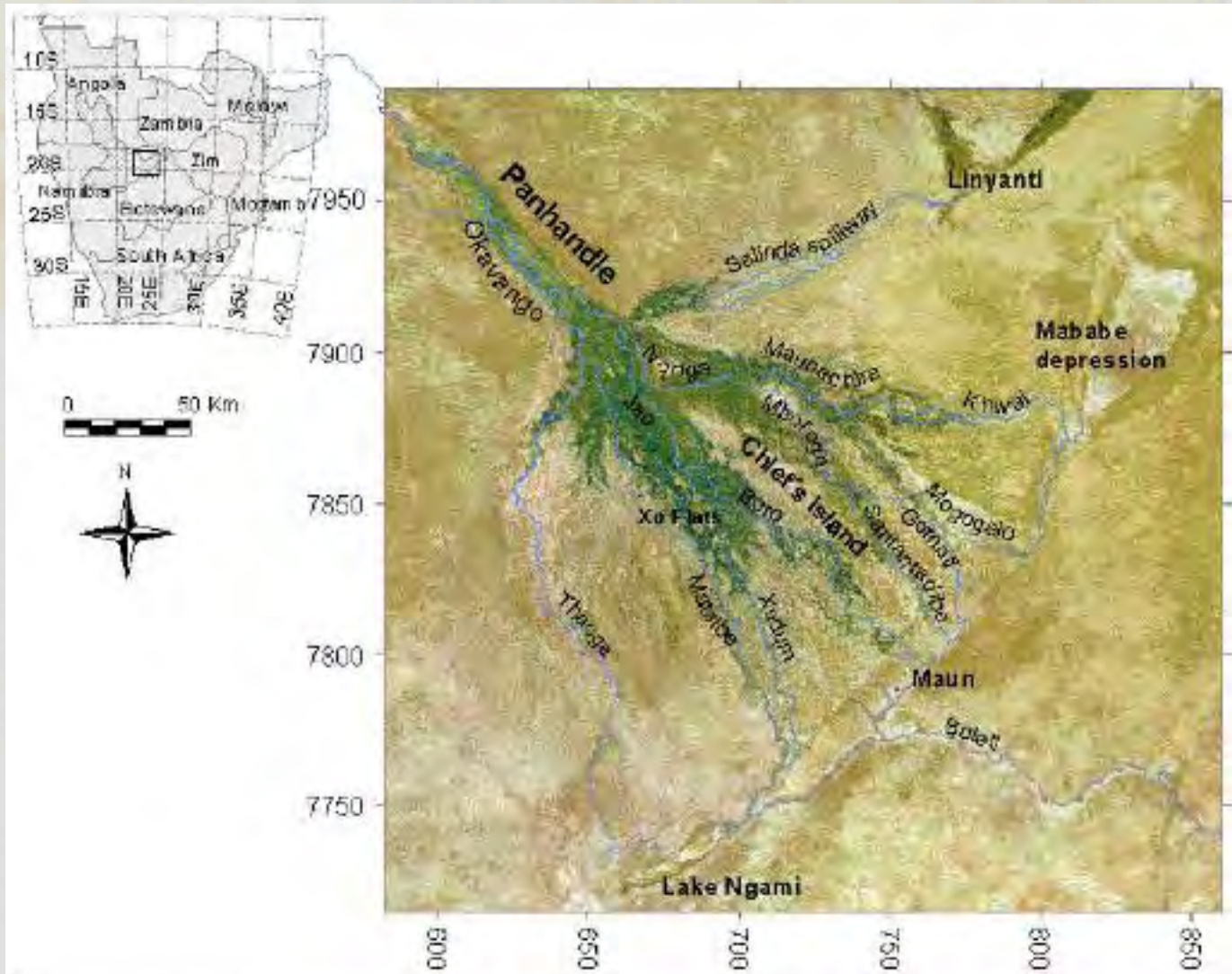
Knowledge based classification of
the Okavango Delta - Botswana

Okavango Delta Image classification

Data sources

- Landsat TM
- NOAA-AVHRR
- ATSR

Okavango Delta - Botswana





Panhandle



Permanent swamps



Seasonal swamps

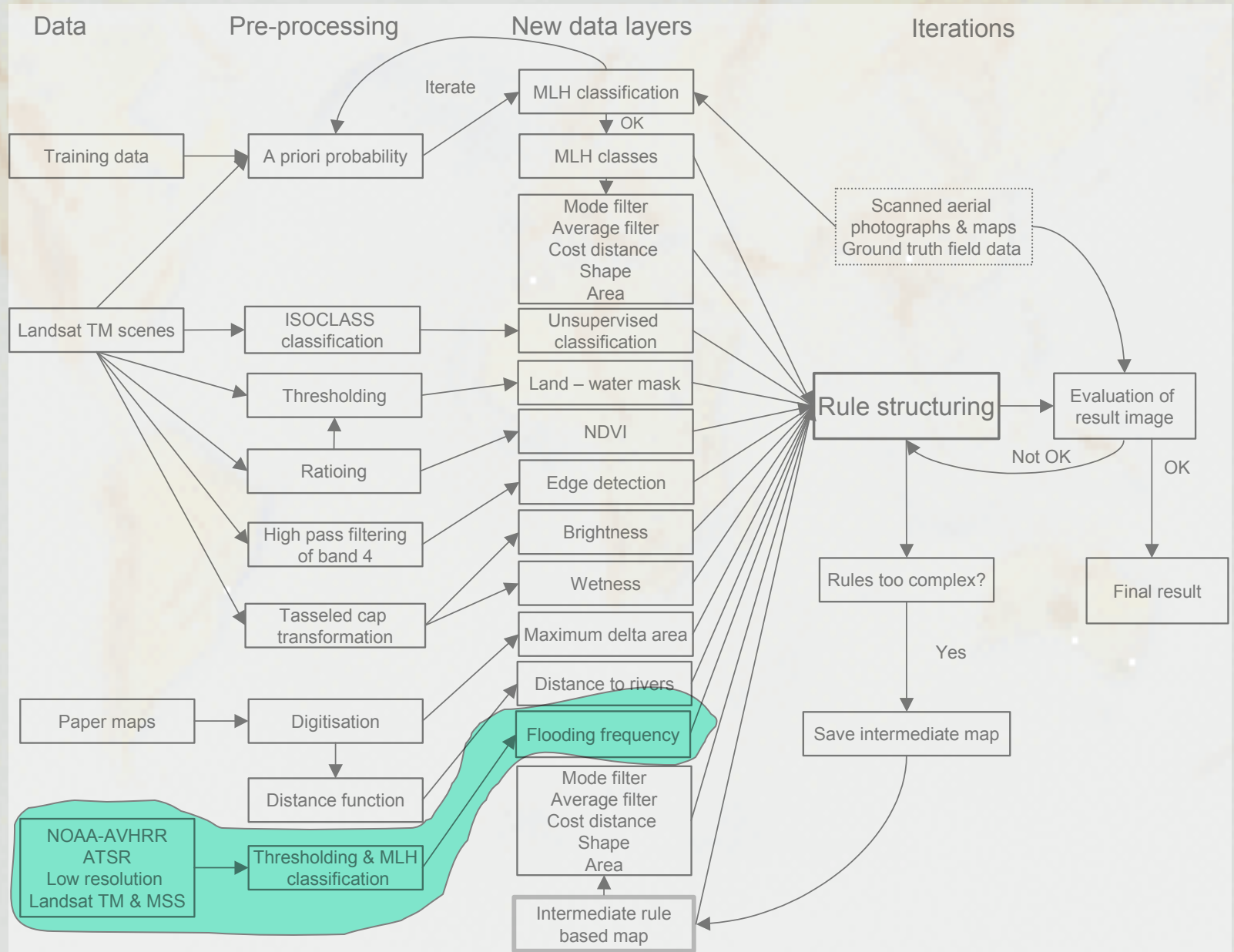


Seasonal swamps, channels



Seasonal swamps, during flood

Okavango Delta knowledge based classification

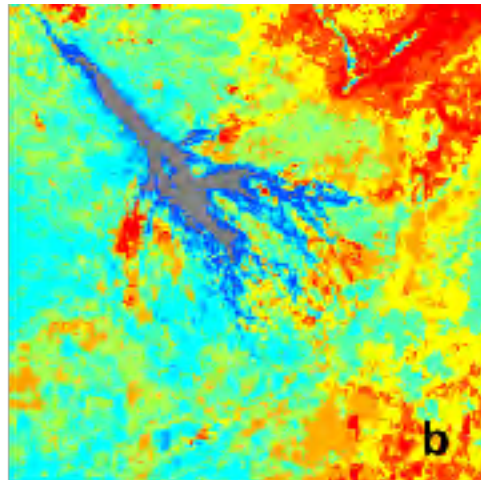


Classification of historical flood areas

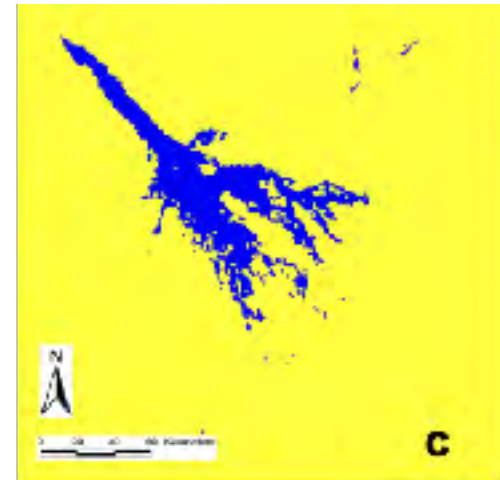
Unsupervised classification of ~ 400 satellite images (NOAA AVHRR, ERS-2 ATSR), and supervised classification of Landsat MSS / TM (subset of ~ 3000 images)



AVHRR

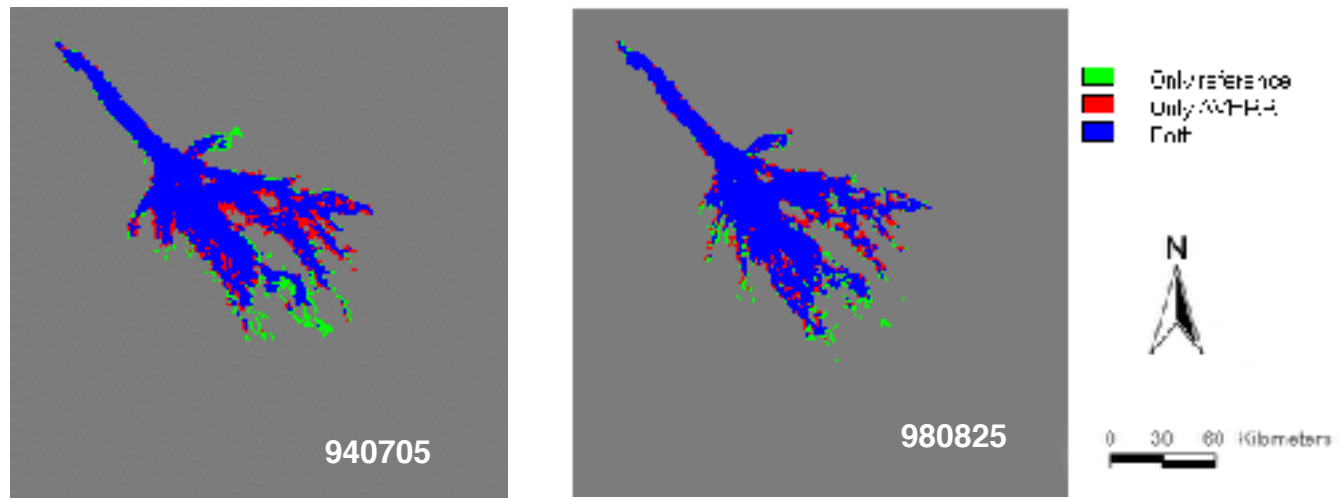


Unsupervised
classification



Manual
reclassification

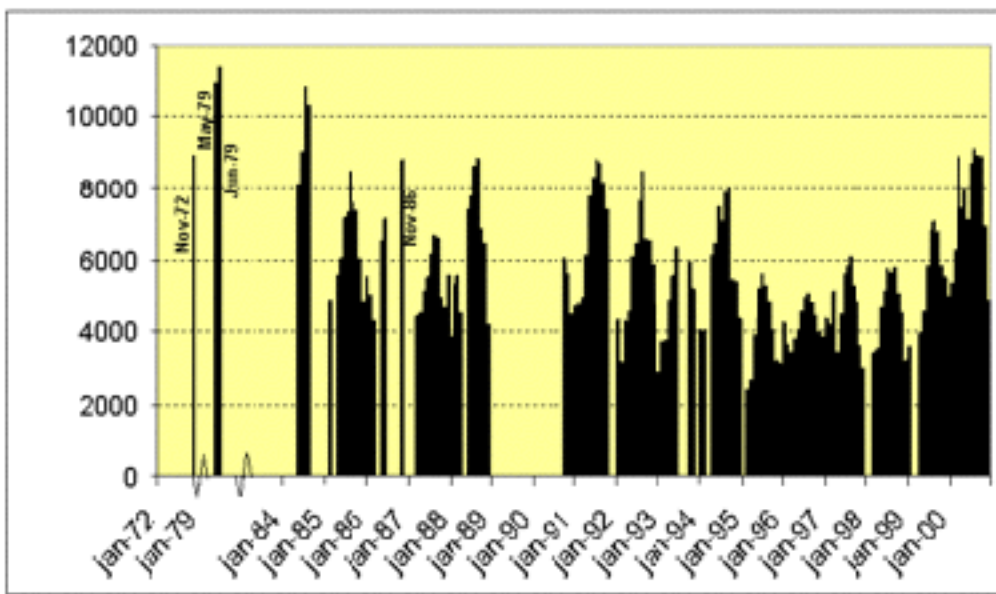
Evaluation of classification accuracy



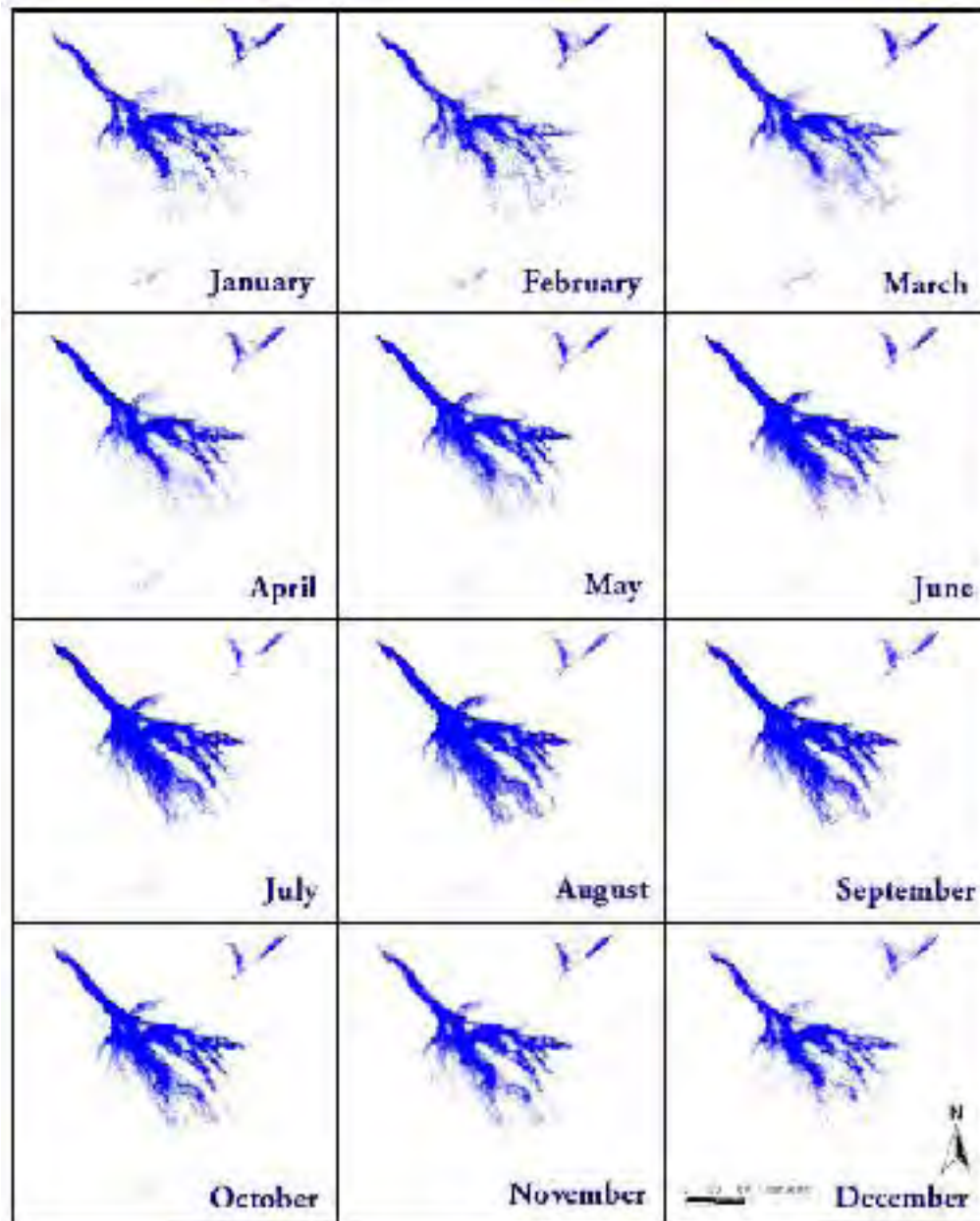
AVHRR vs. Landsat TM

AVHRR vs. ATSR

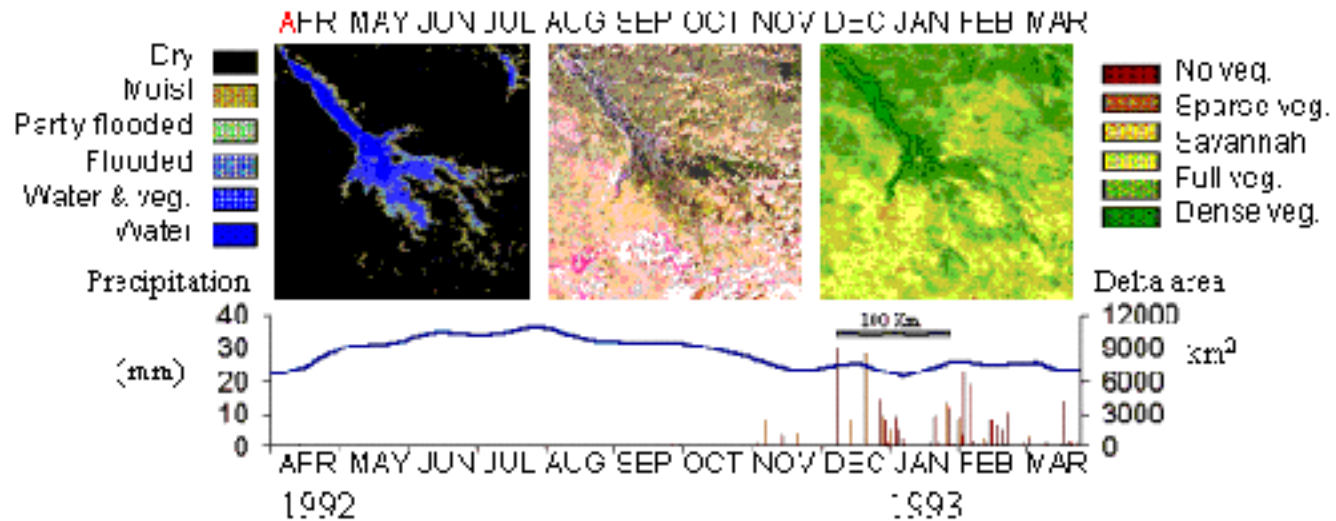
Flooding 1985-2000



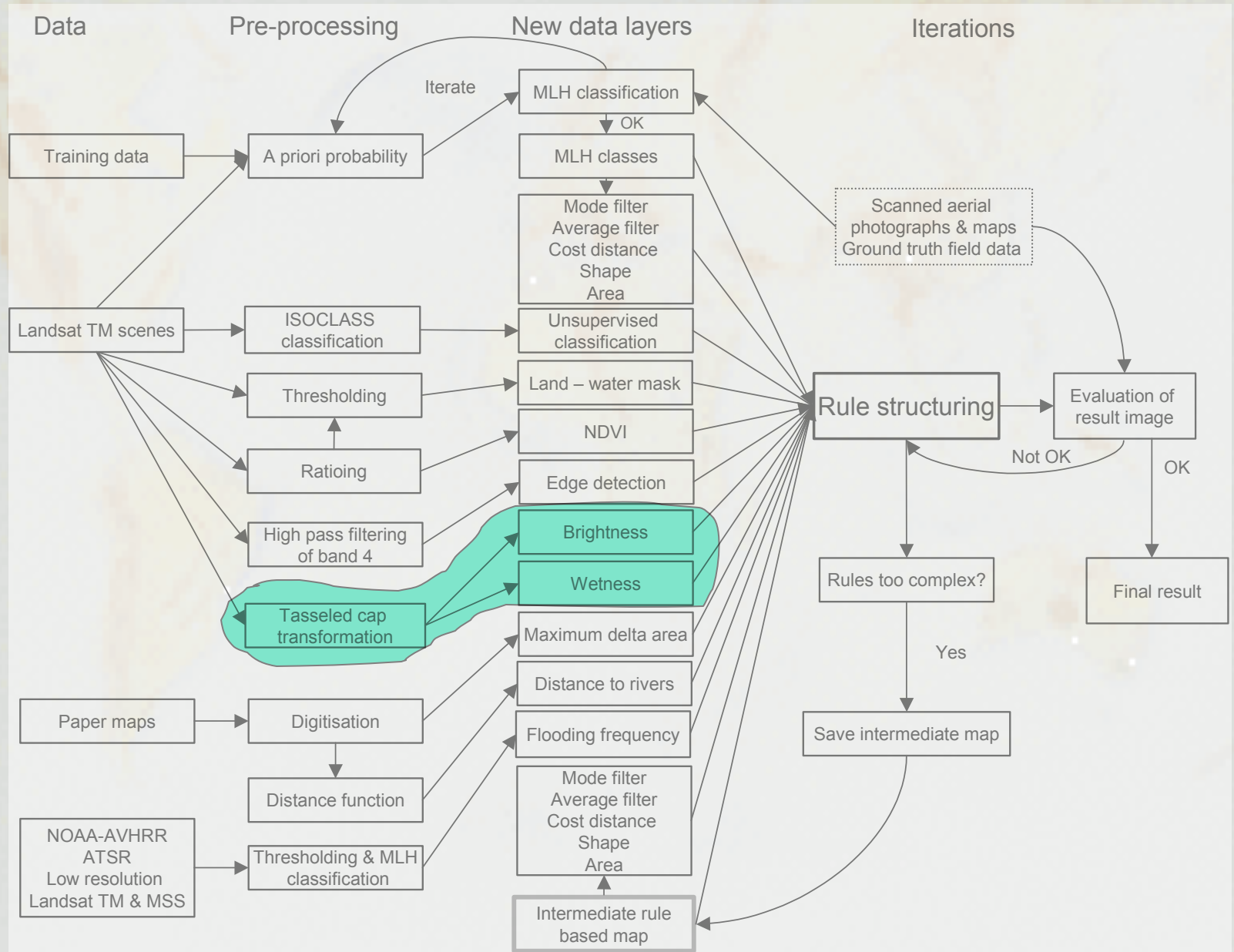
Flooding month 1985-2000



Okvango Delta Water balance 1992/93



Okavango Delta knowledge based classification

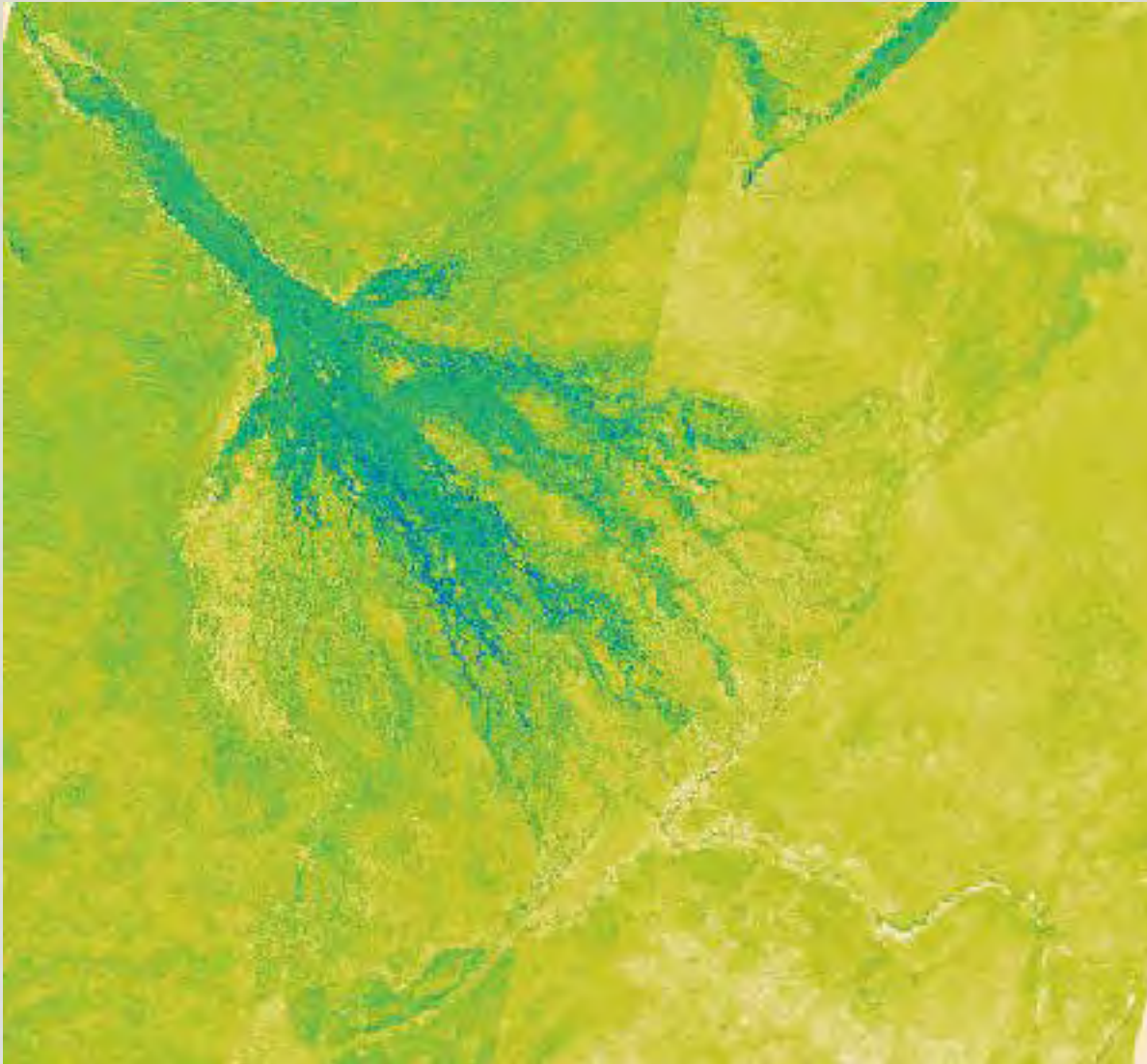


Okavango Delta knowledge based classification



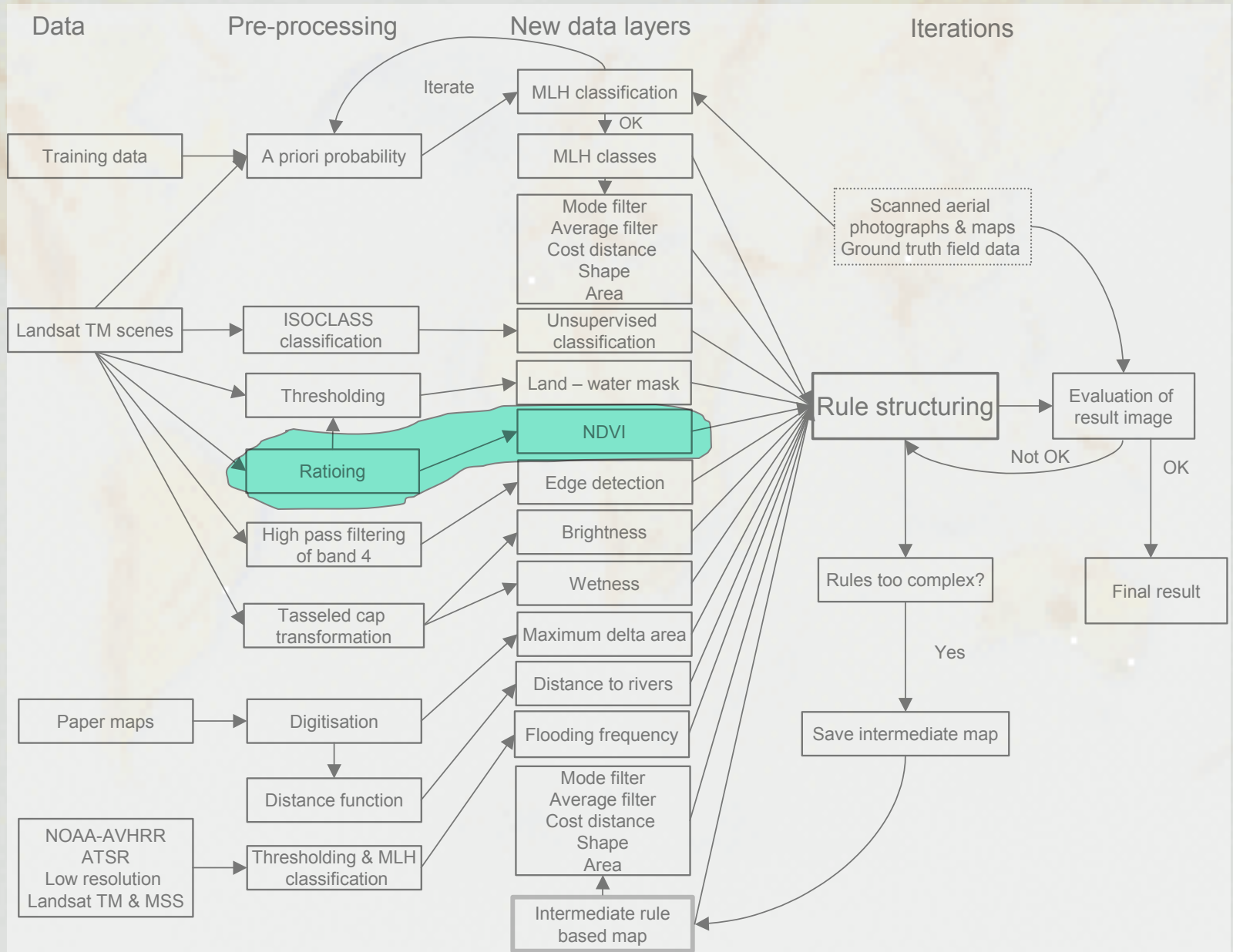
Input data:
Landsat TM
Tasseled cap
Brightness

Okavango Delta knowledge based classification

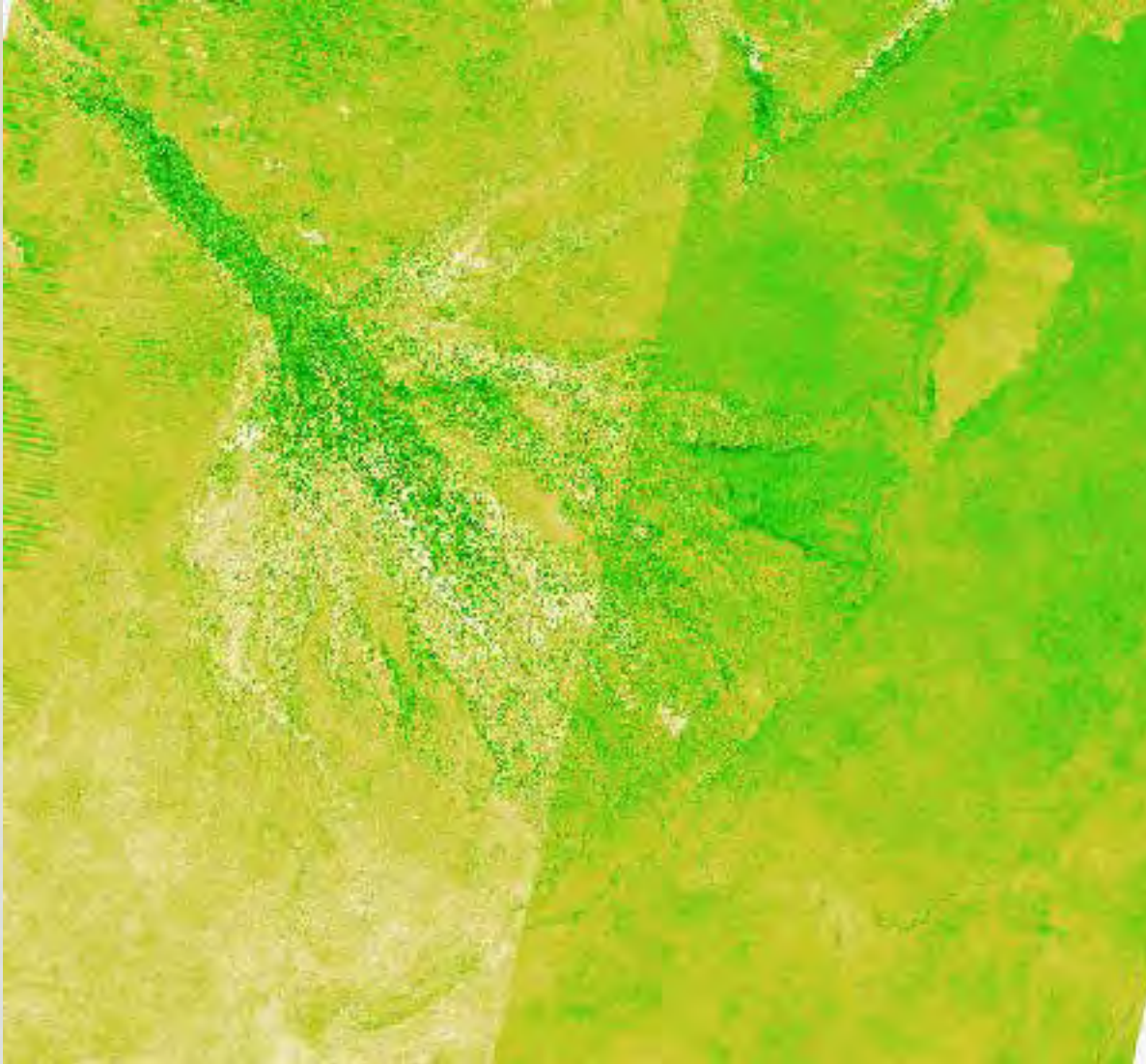


Input data:
Landsat TM
Tasseled cap
Wetness

Okavango Delta knowledge based classification

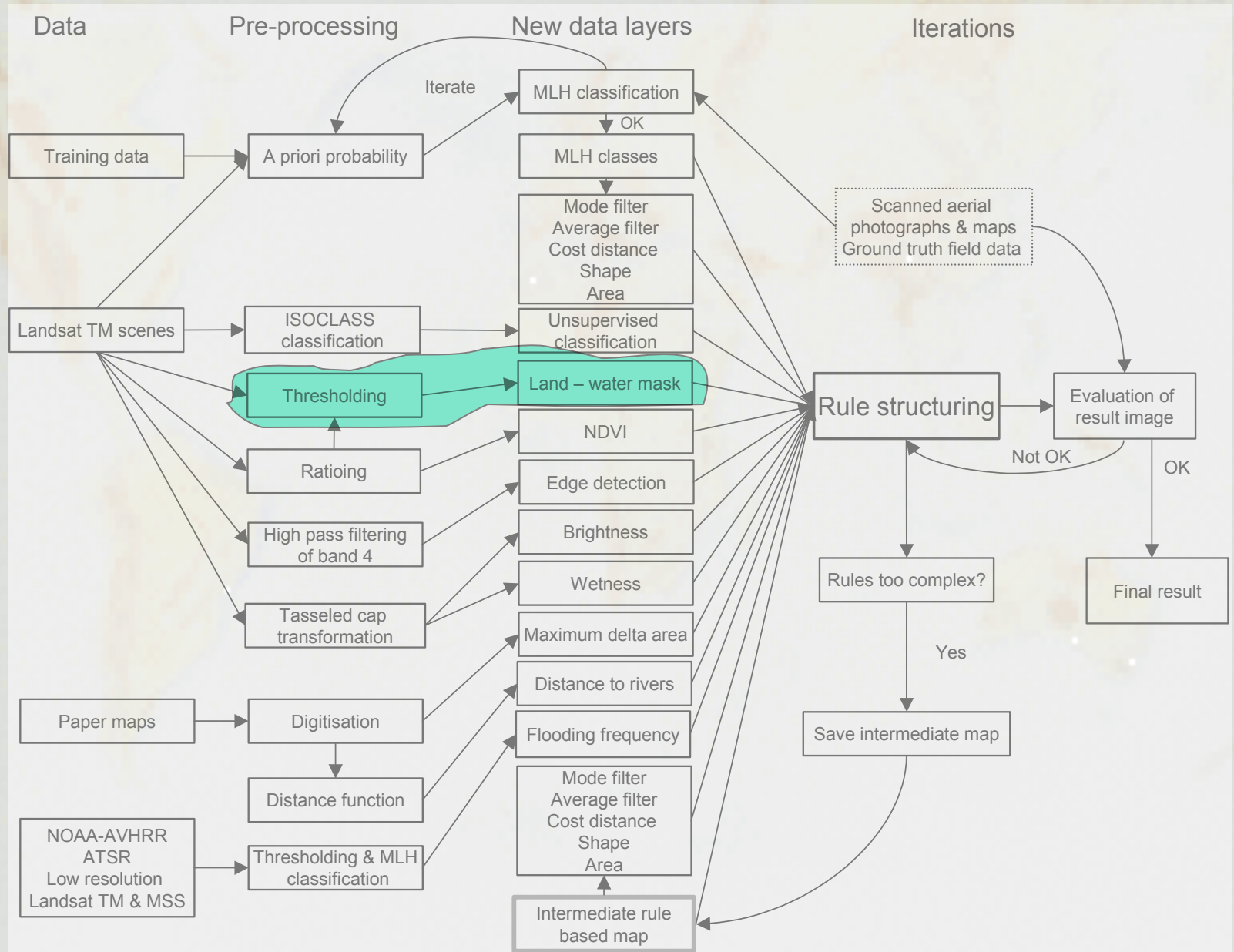


Okavango Delta knowledge based classification

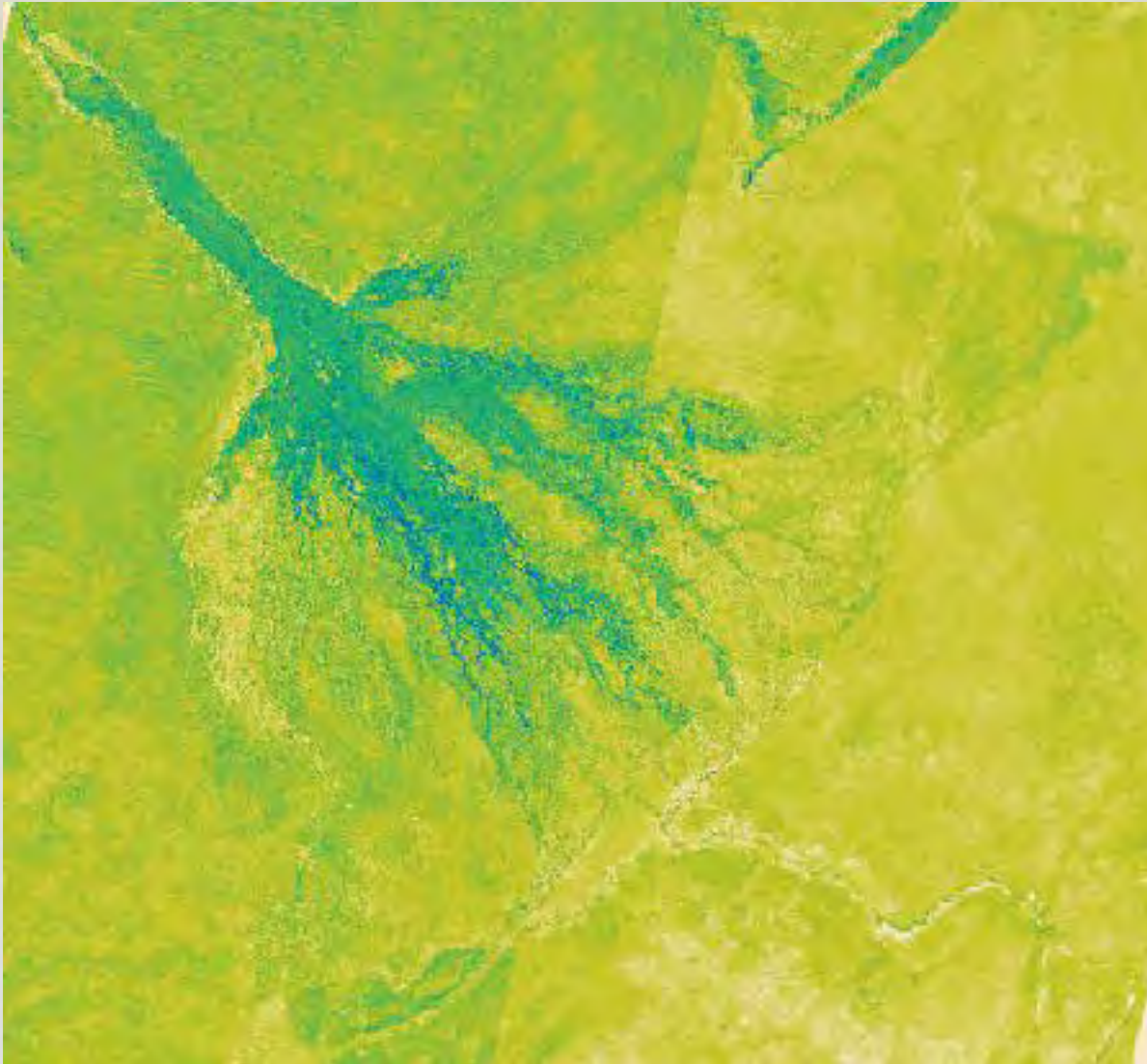


Input data:
Landsat TM
NDVI

Okavango Delta knowledge based classification

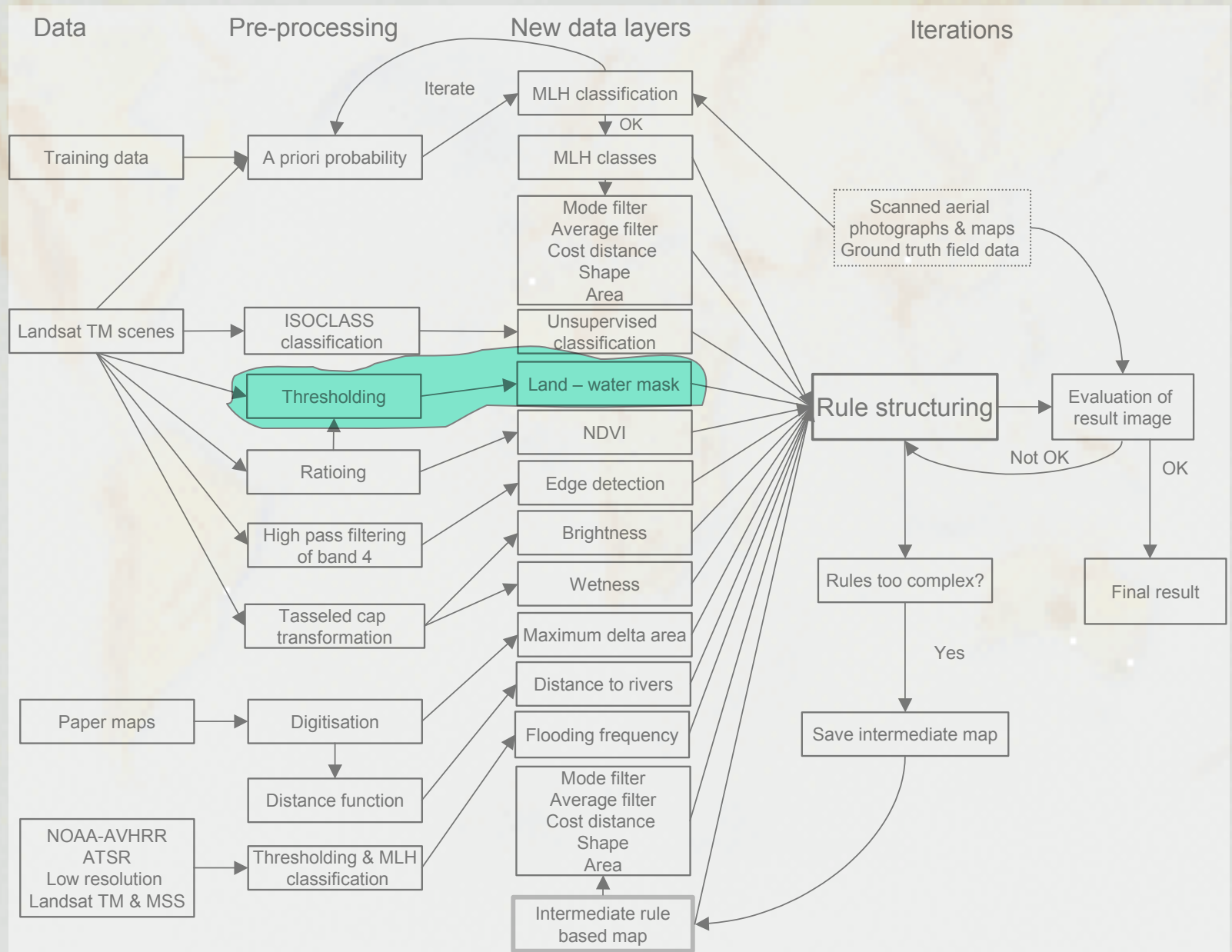


Okavango Delta knowledge based classification



Input data:
Landsat TM
Tasseled cap
Wetness

Okavango Delta knowledge based classification

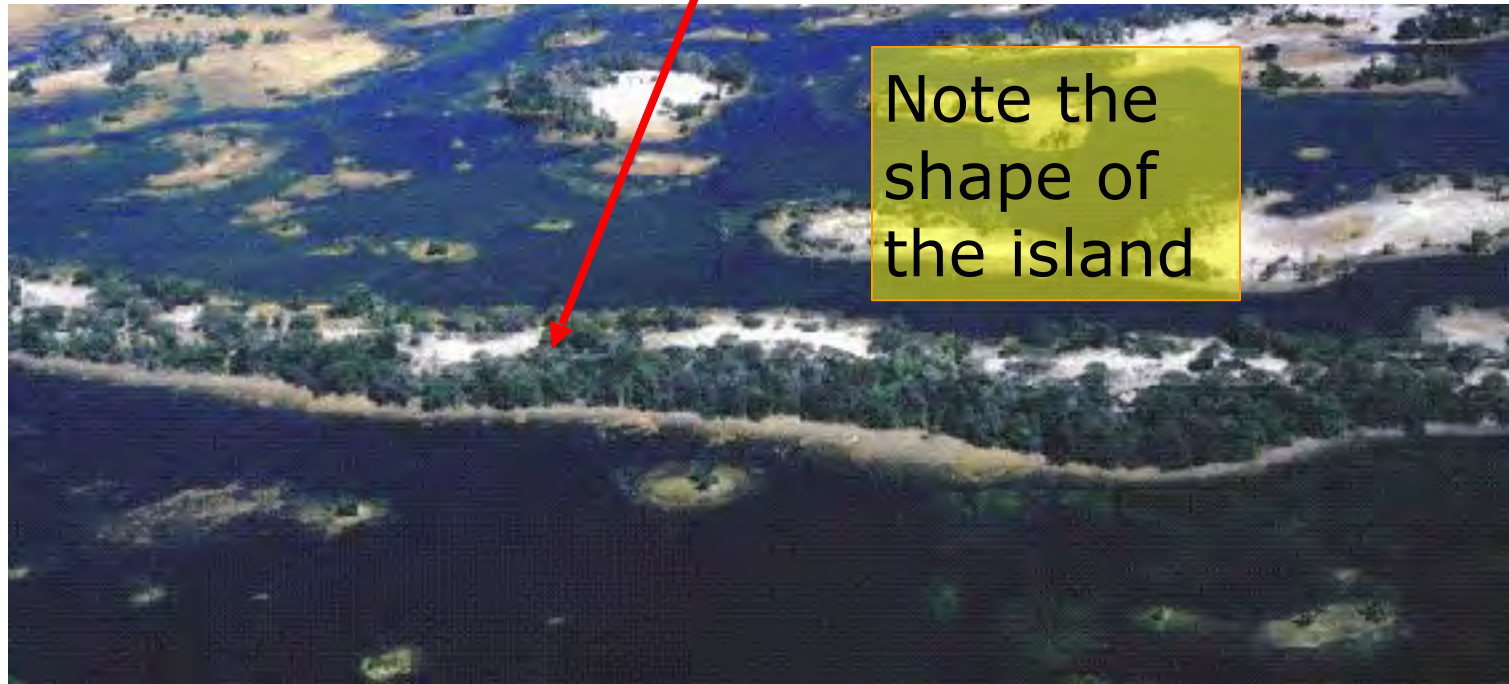


Islands as object models and how to classify

Primary islands built from accumulation of clastic sediments

Island types

Inverted channel island



Primary islands built from accumulation of clastic sediments

Island types

Scroll bar island

Note the
shape of
the
islands,
and their
position
adjacent
to the
channel



Primary islands built from accumulation of clastic sediments

Island types

Anthill island



Secondary islands grown from precipitation of chemical sediments

Island types

Riparian forest island



Secondary islands grown from precipitation of chemical sediments

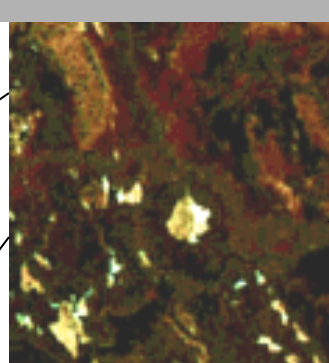
Island types

Salt islands



Component scale

Landsat TM



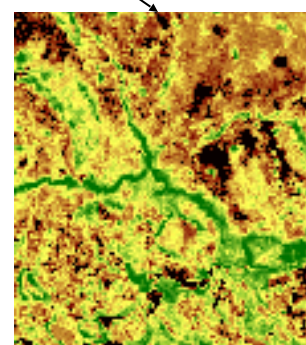
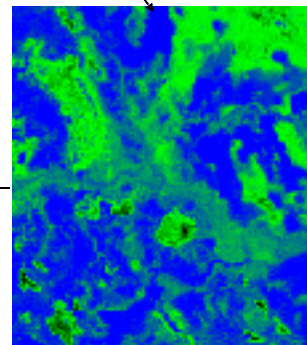
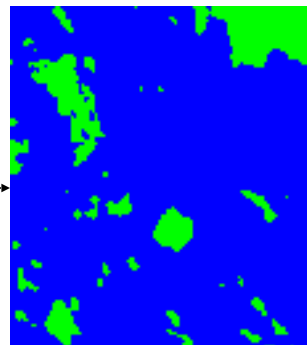
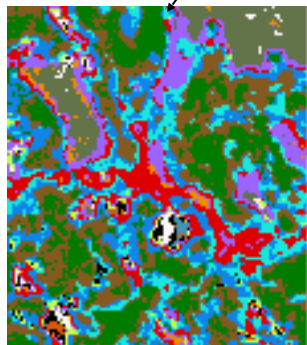
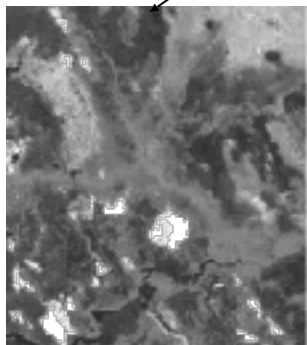
Brightness

tNDVI

classification

o.o. islands

wetness

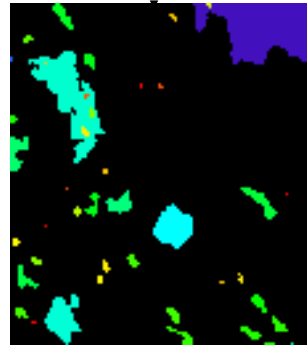


salt or not

shape

NDVI profile

Object oriented island features



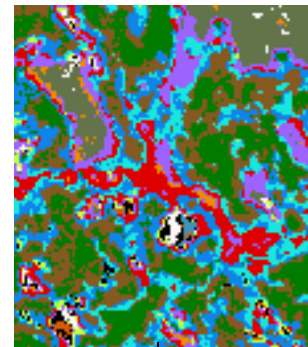
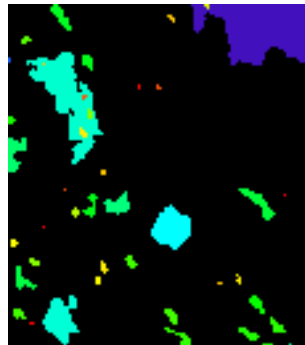
salt or not

shape

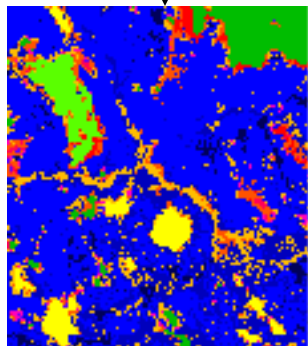
NDVI profile

classification

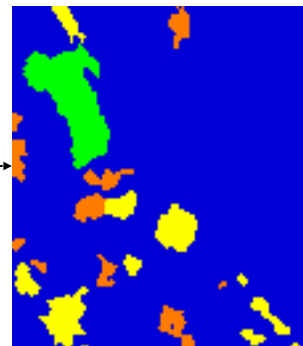
Object oriented island features



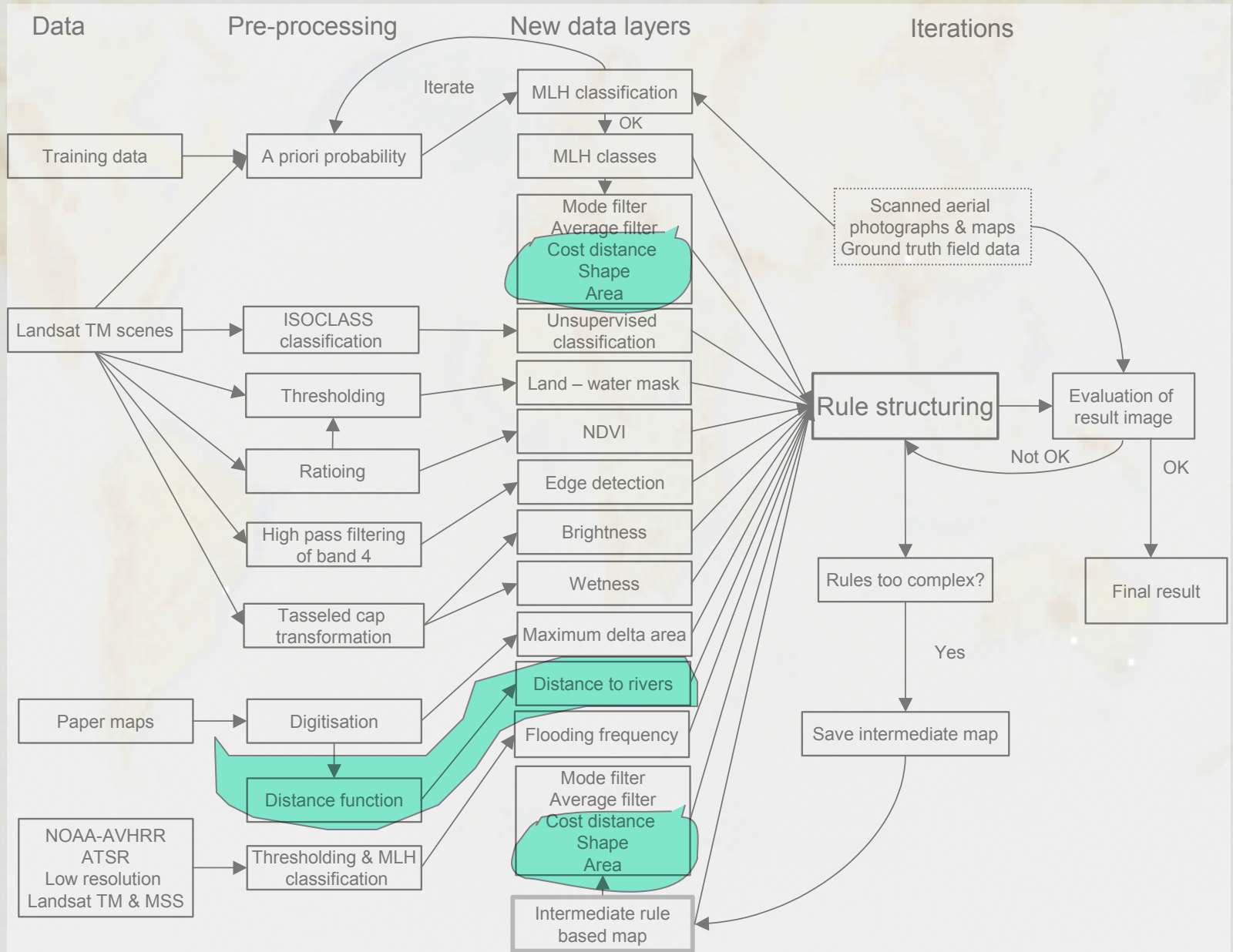
Rule based (if ... then ...) classification

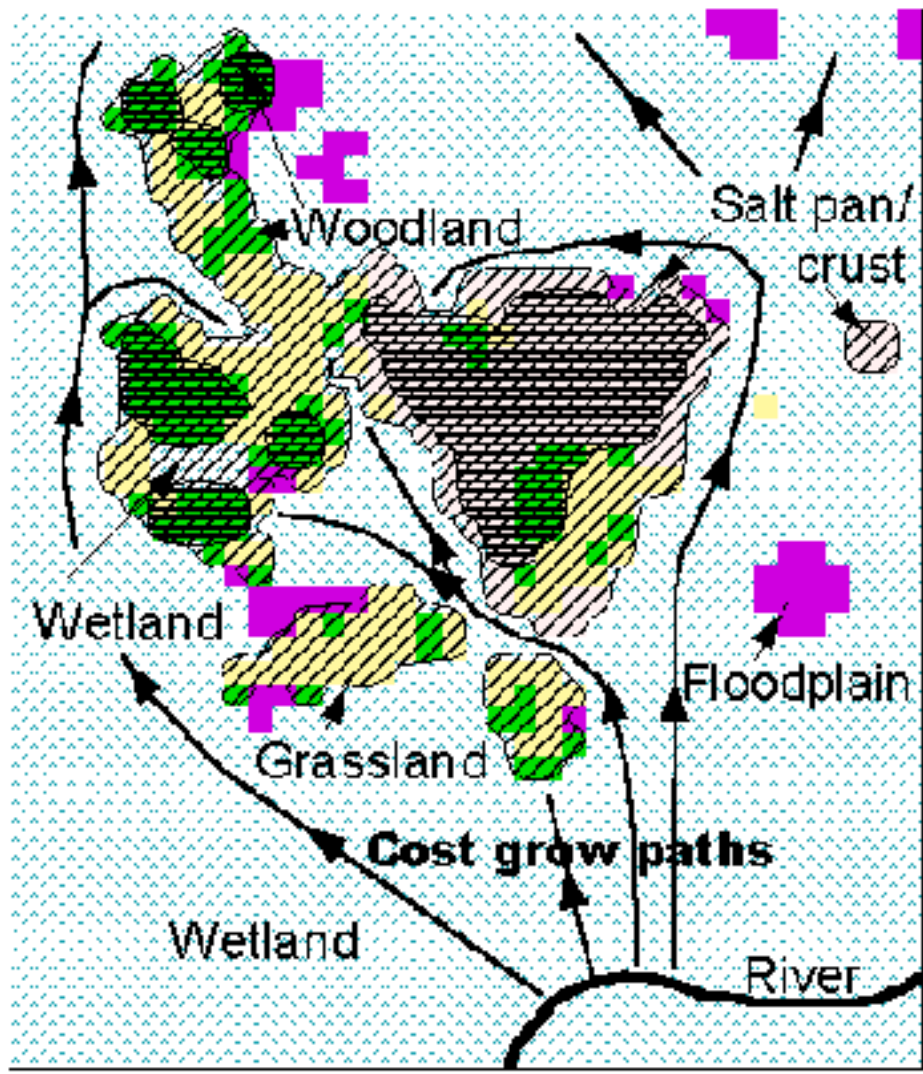


island generalisation



Okavango Delta knowledge based classification



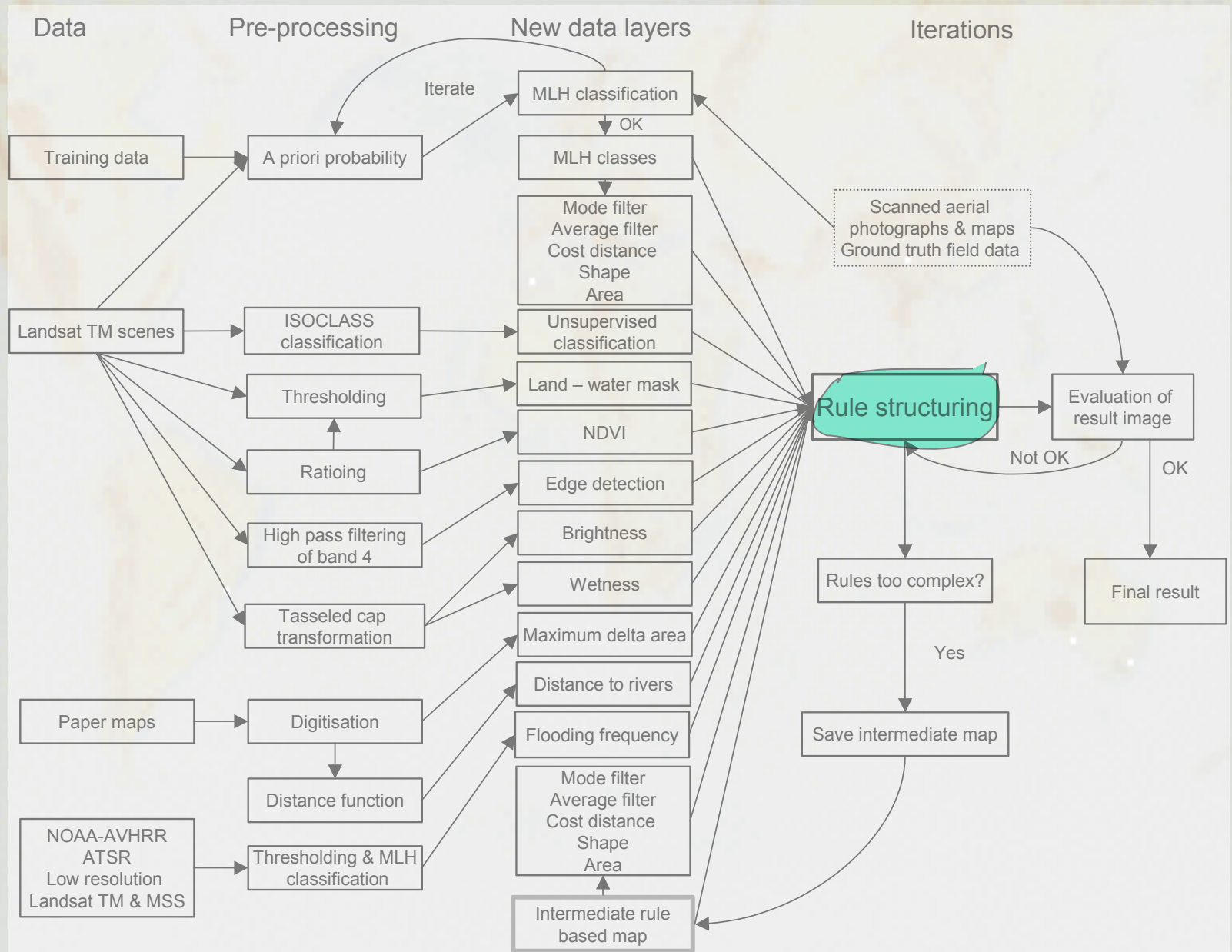


Island max



Island core

Okavango Delta knowledge based classification



Okavango Delta knowledge based classification

Local rules

Focal rules

Regional rules



**Water = 2.5 m below reference
level**



Permanent Swamp = 2.0 m below reference level



Primary floodplain = 1.5 m below reference level



Secondary floodplain = 1.0 m below reference level



Secondary Floodplain (in flood)

Grassland = reference level



Grassland

Salt pan = 0.5 m below reference level



Dry Grassland/Salt Pan

Occasionally flooded grassland = 0.5 m below reference level



Grassland (with occasional flooding)

Salt pan = 0.5 m below reference level



Dry Grassland/Salt Pan (with flooding)

Riverine forest = 1.2 m above reference level



Dry woodland = reference level



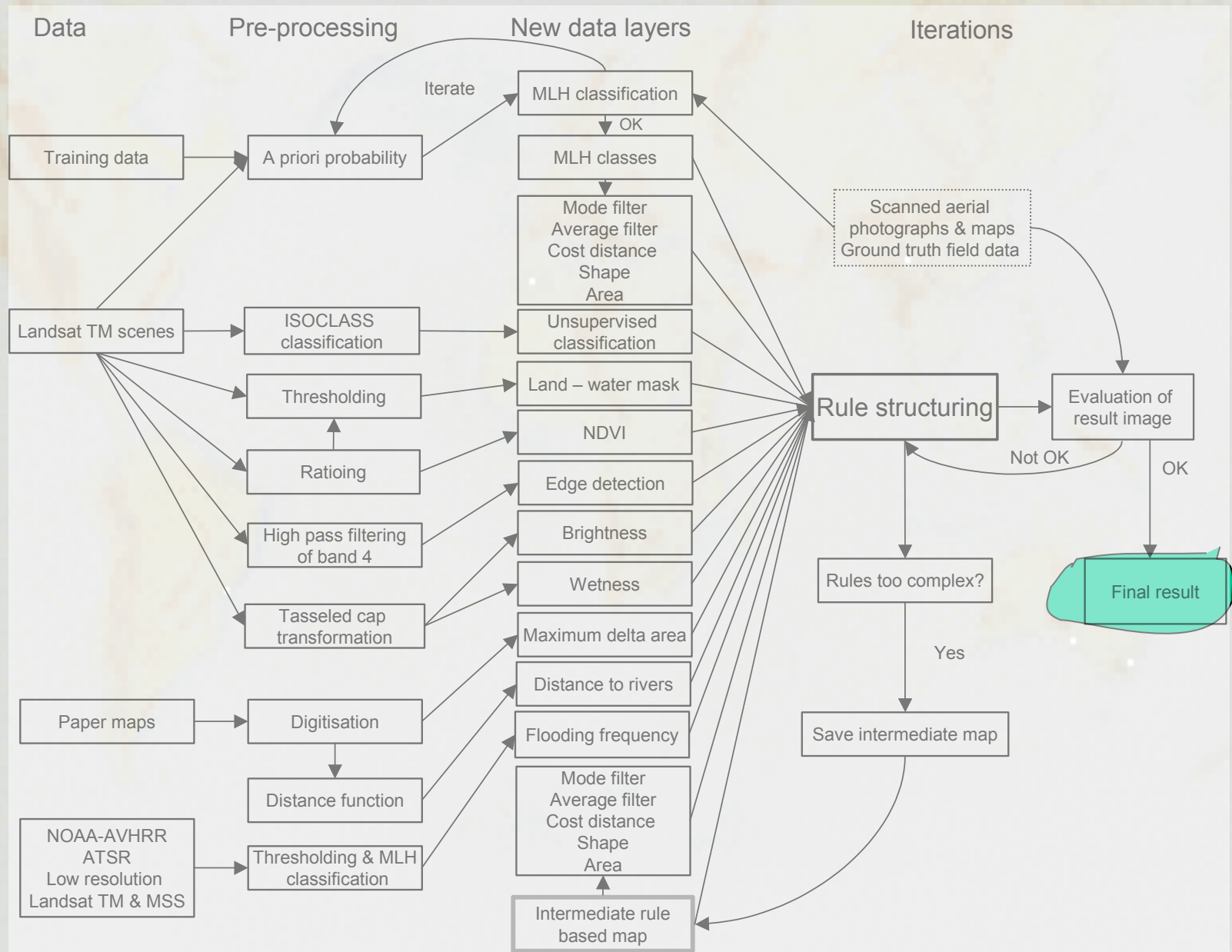
Dry Woodland (dominated by Mopane)

Dry woodland = reference level

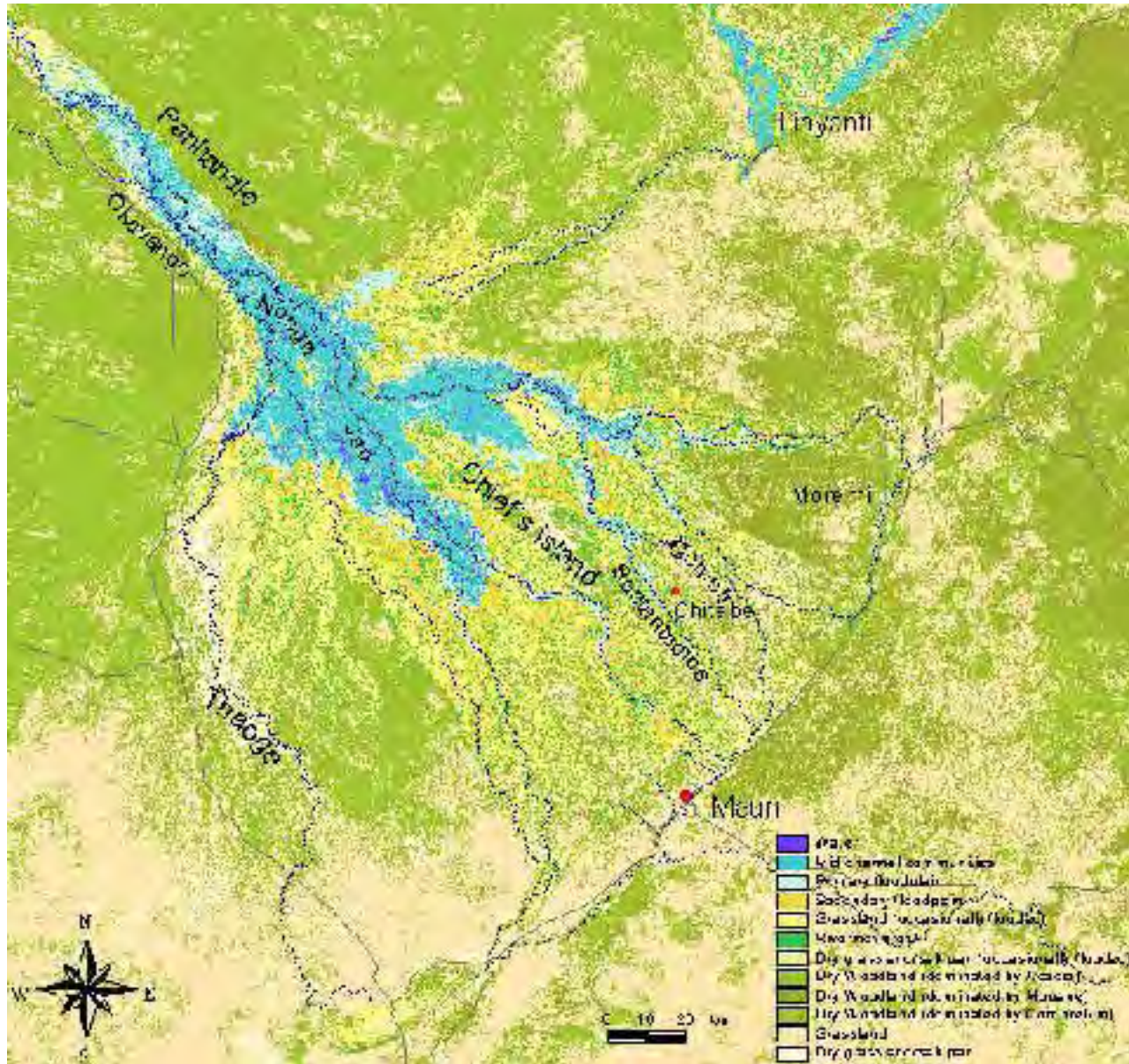


Dry Woodland (dominated by Acacia)

Okavango Delta knowledge based classification



Landcover ecoregions



www.mapjourney.com/okavango



Mapjourney.com

Mapjourney.com is a private Web-page by Thomas Gumbicht S. Maria Nambola

The web-pages of mapjourney.com are the result of many years of research in many Africa. If you want to learn more about Africa and its unique environment mapjourney.com is a good starting place.

Welcome to mapjourney.com

Sahel

These pages are made for browsing on local computers and are of higher quality than the pages available on line. This is a draft version (1.0) and several links are missing or incomplete. Please check on [mapjourney.com](http://www.mapjourney.com) to see when updates are available.



Use of frameset

The web-pages of mapjourney.com are built using framesets. The pages are made for screens with a width of 1280 pixels. The frameset, however, will allow you to resize the window-frames to fit a so smaller screens.

