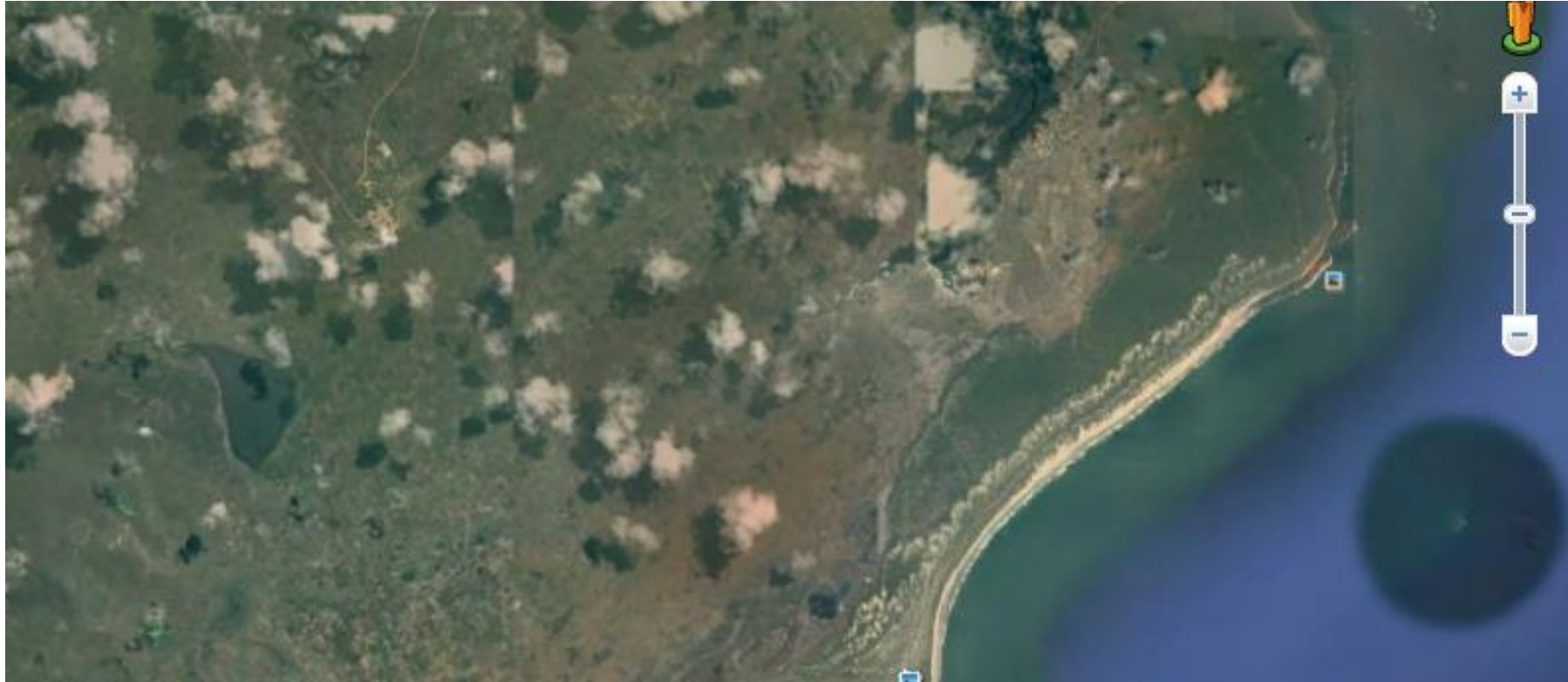
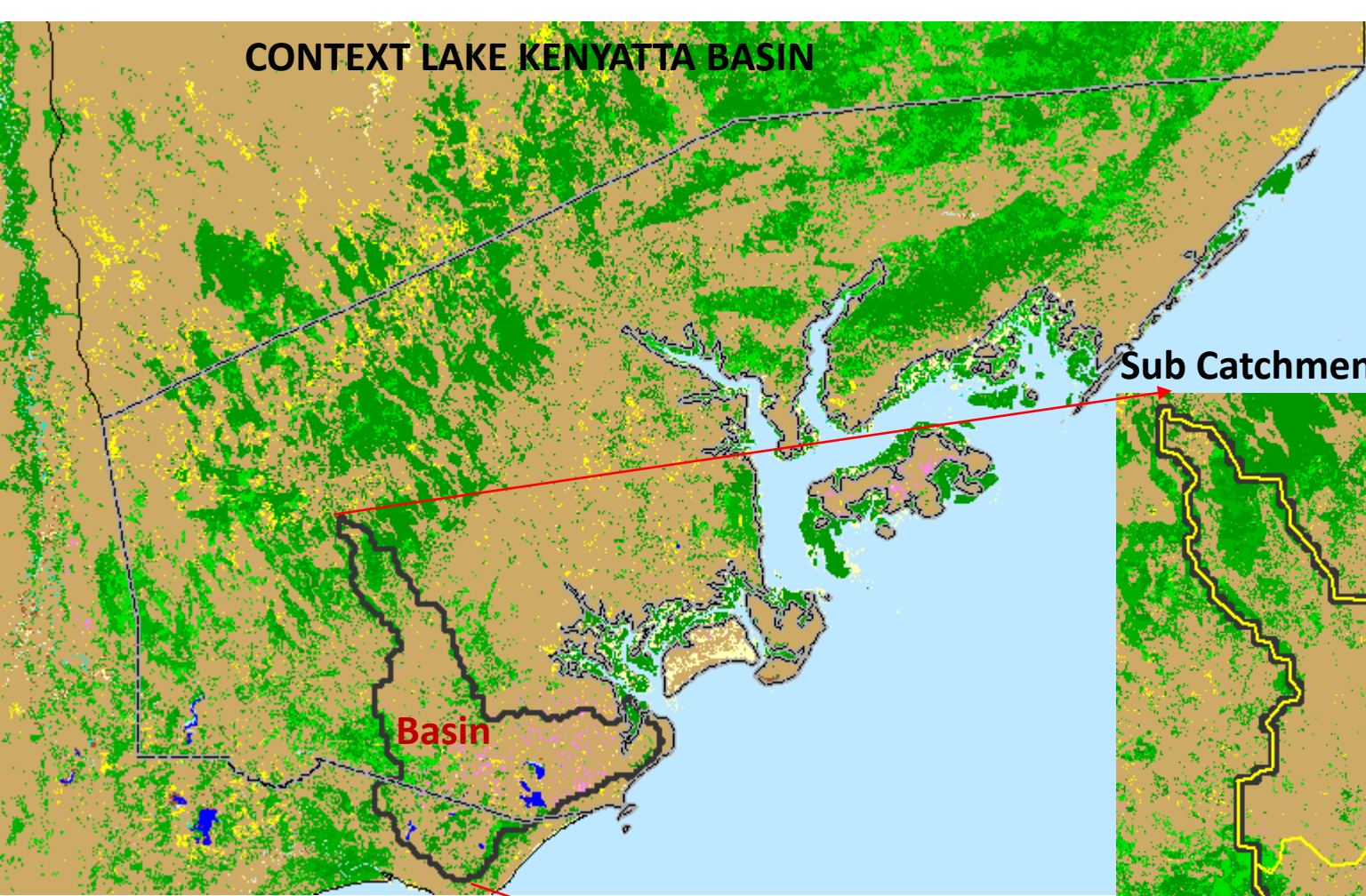


# Land Use /Cover Trends, Catchment Assessment Lake Kenyatta Basin

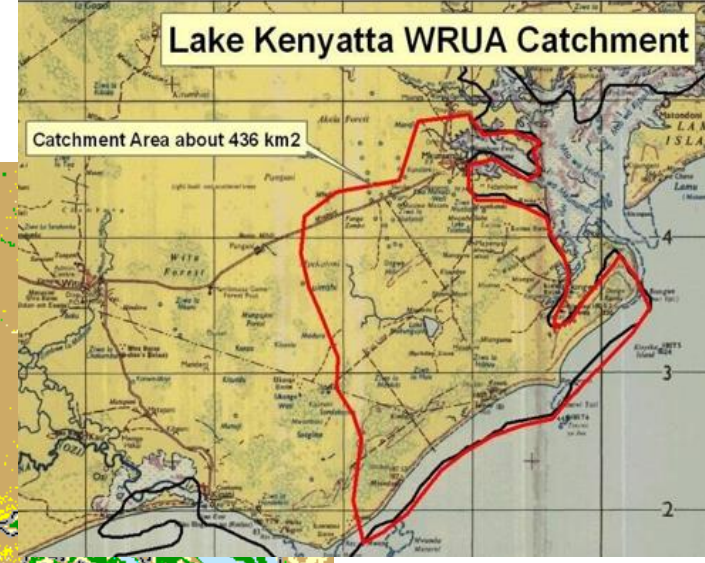
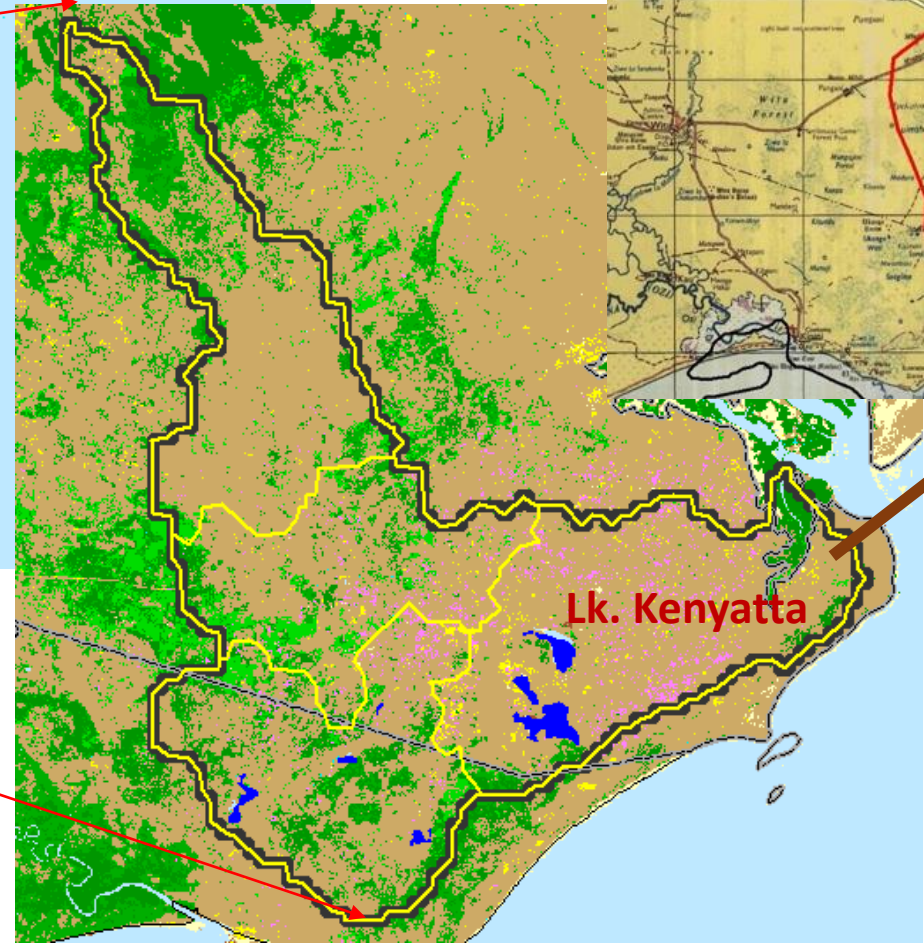


**Siro Abdallah ( GIS & Modeling Expert)  
Spatial Planning - CoE  
WWF Kenya - August, 2017.**

# CONTEXT LAKE KENYATTA BASIN



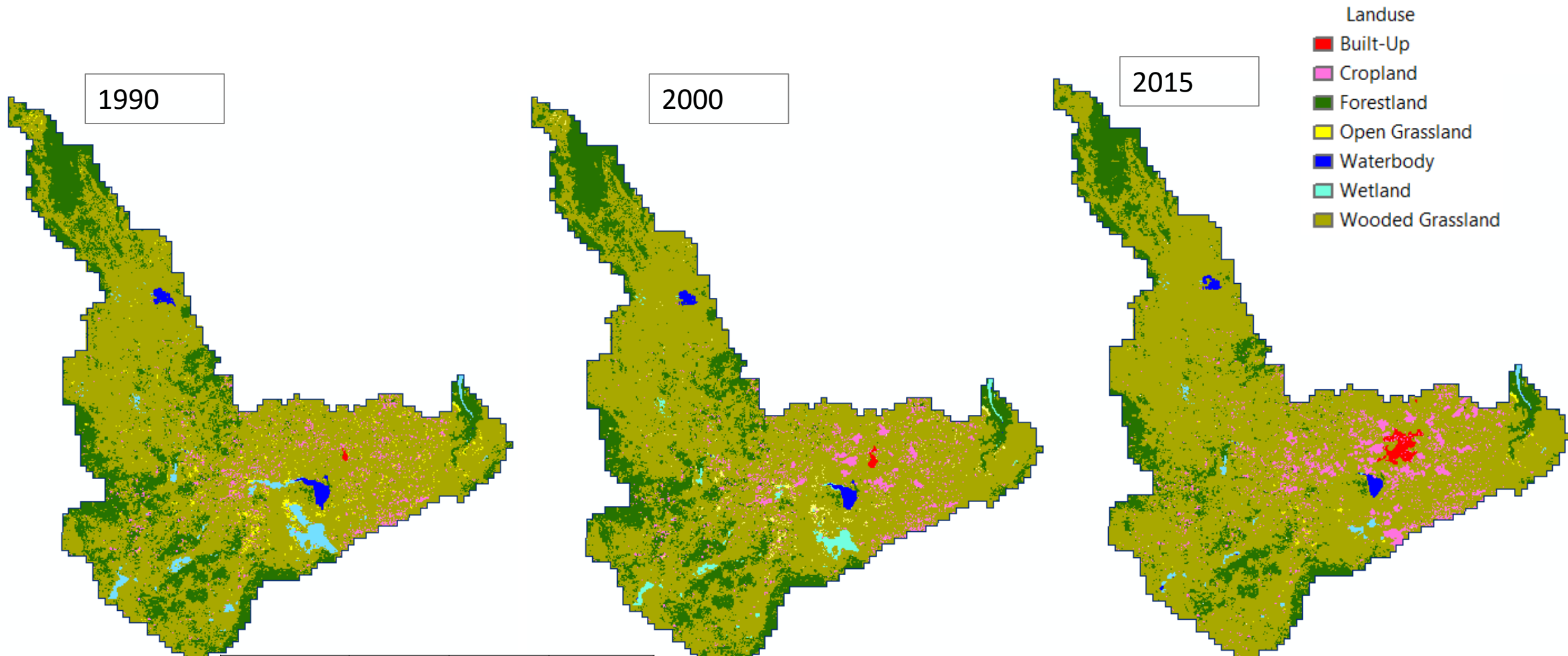
## Sub Catchments in the Basin



- Land use/Cover Assessment
- Lake surface extent Assesment



# Land Use Land Cover / Change Assessment - Lk. Kenyatta Basin

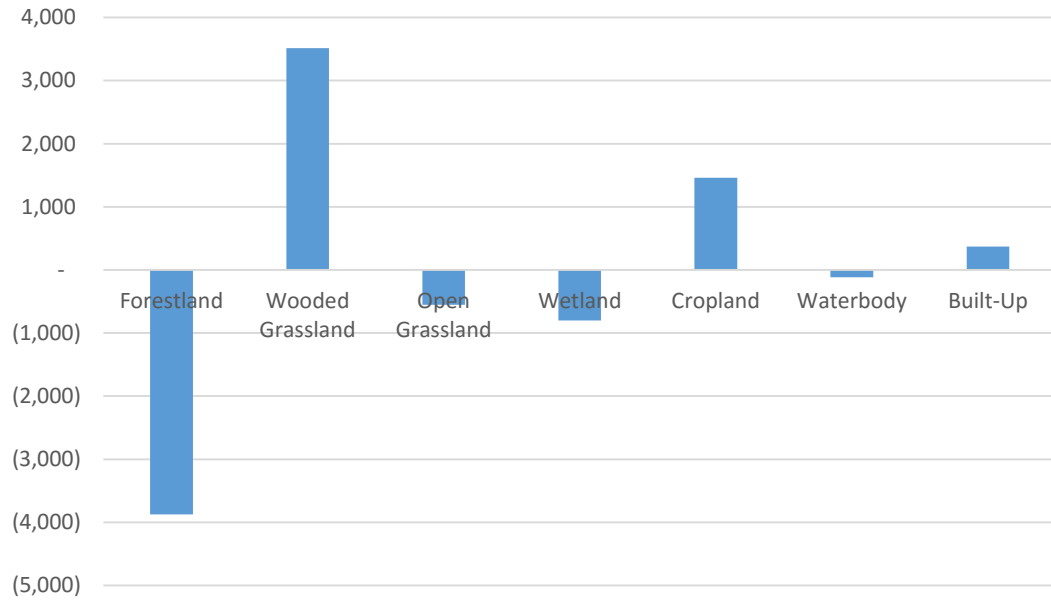


- Landuse
- Built-Up
  - Cropland
  - Forestland
  - Open Grassland
  - Waterbody
  - Wetland
  - Wooded Grassland

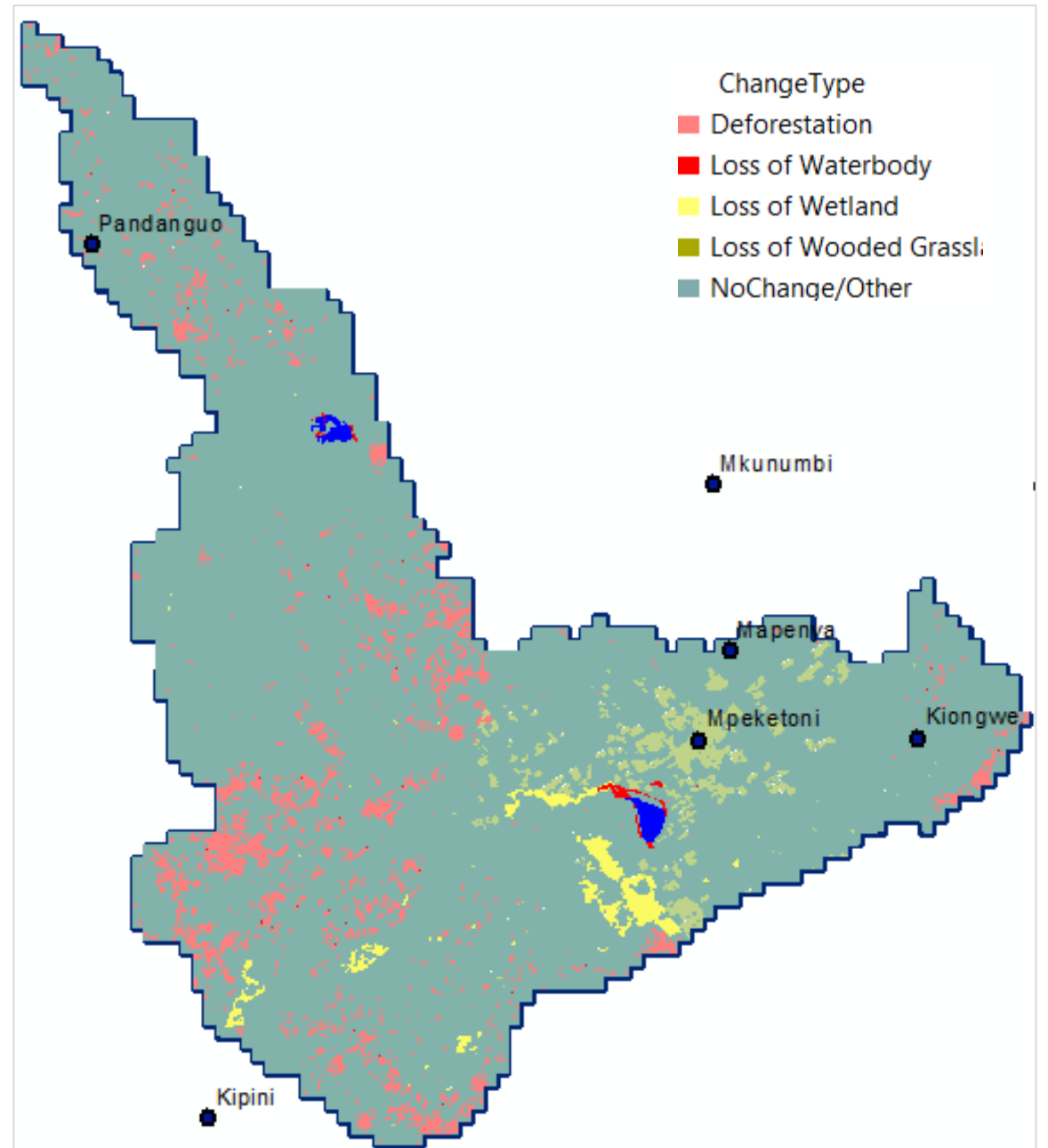
LandCover	Area(ha) 1990	Area(ha) 2000	Area (ha) 2015
Forestland	12,246	12,031	8,371
Wooded Grassland	42,463	42,919	45,977
Open Grassland	656	381	105
Wetland	1,166	737	363
Cropland	1,475	1,965	2,936
Waterbody	366	300	249
Built-Up	27	64	396
Total	58,398	58,398	58,398

# Land Use Land Cover / Change Assessment - Lk. Kenyatta Basin

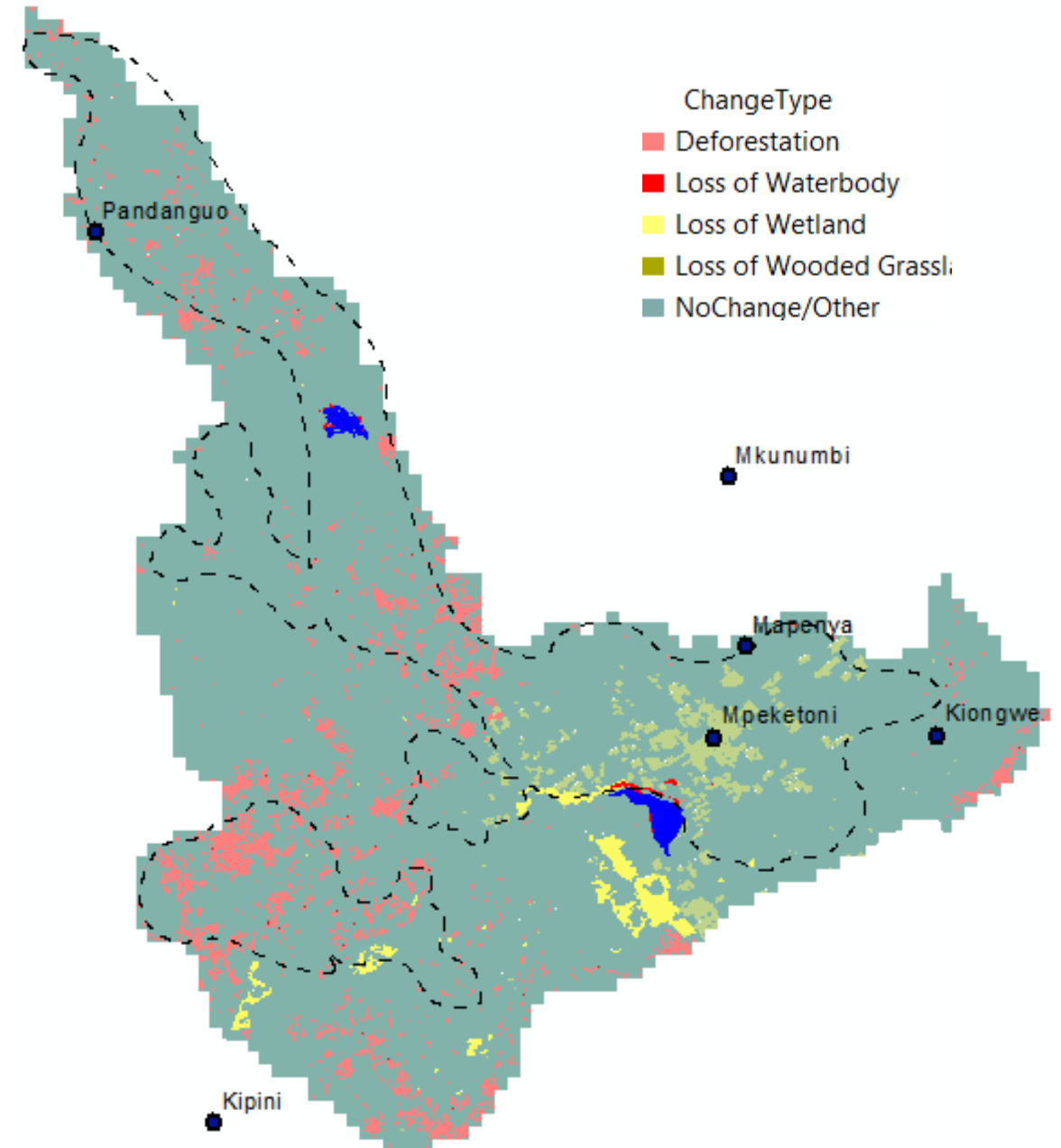
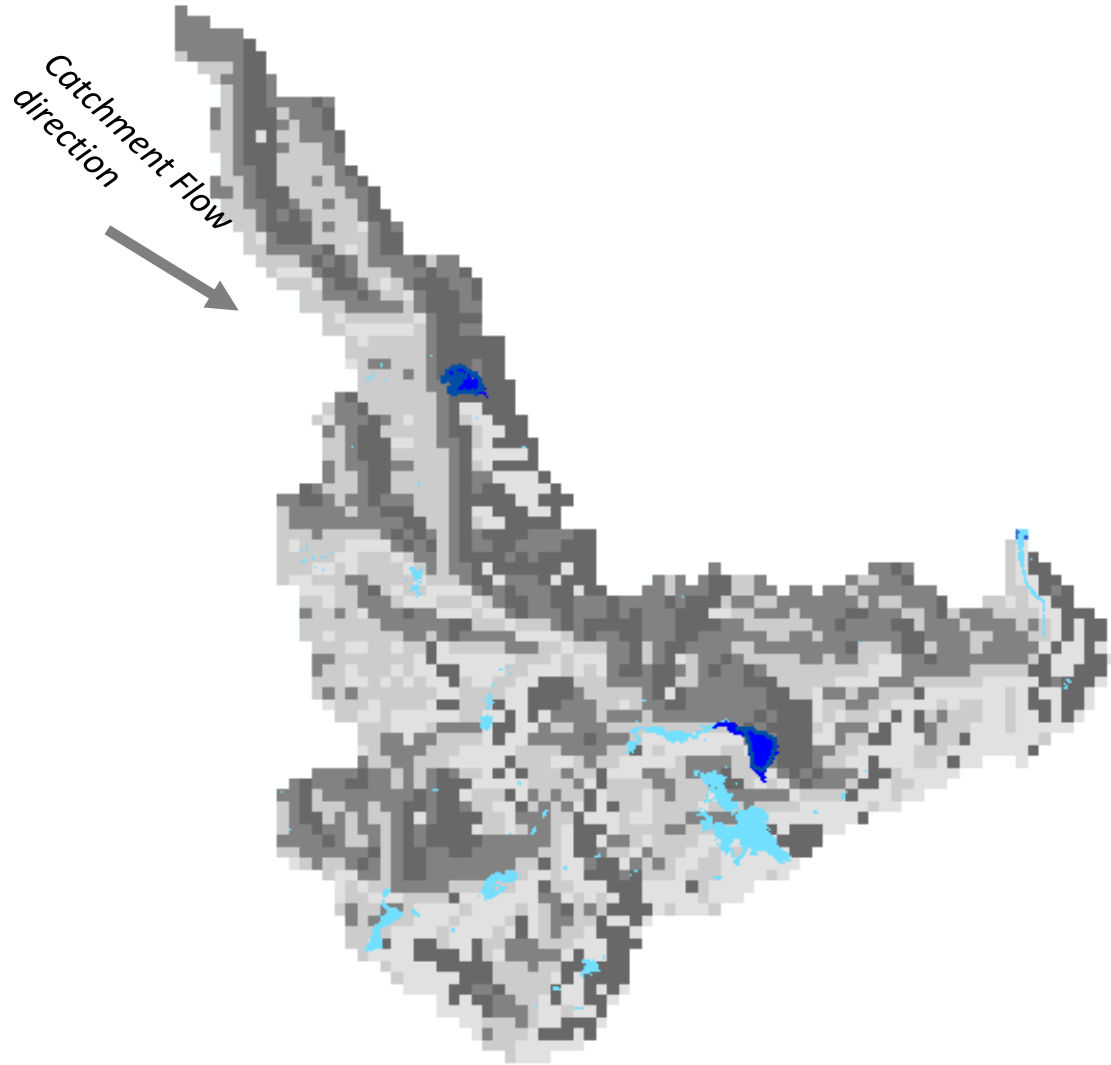
## LULC Change 1990 - 2015



LandCover	Area(ha) 1990	Area(ha) 2000	Area (ha) 2015	change 2015/1990	2015/1990 %loss/gain
Forestland	12,246	12,031	8,371	(3,875)	(32)
Wooded Grassland	42,463	42,919	45,977	3,514	8
Open Grassland	656	381	105	(550)	(84)
Wetland	1,166	737	363	(803)	(68)
Cropland	1,475	1,965	2,936	1,462	99
Waterbody	366	300	249	(117)	(32)
Built-Up	27	64	396	369	93
Total	58,398	58,398	58,398		



Manifestation of massive deforestation and woodland loses is active along the MAIN sections of the lake catchment



## Water Levels - Occurrence/transitions (Catchment Level)

### Volume total 2016:

5.89 million Cubic meters (5,890,000m<sup>3</sup>)

### Average Depth (ratio between total lake volume ('Vol\_total') and lake area ('Lake\_area')):

3.5meters

### Average Discharge (Average long-term discharge flowing through the lake, in cubic meters per second):

2.234 cubic meters /second

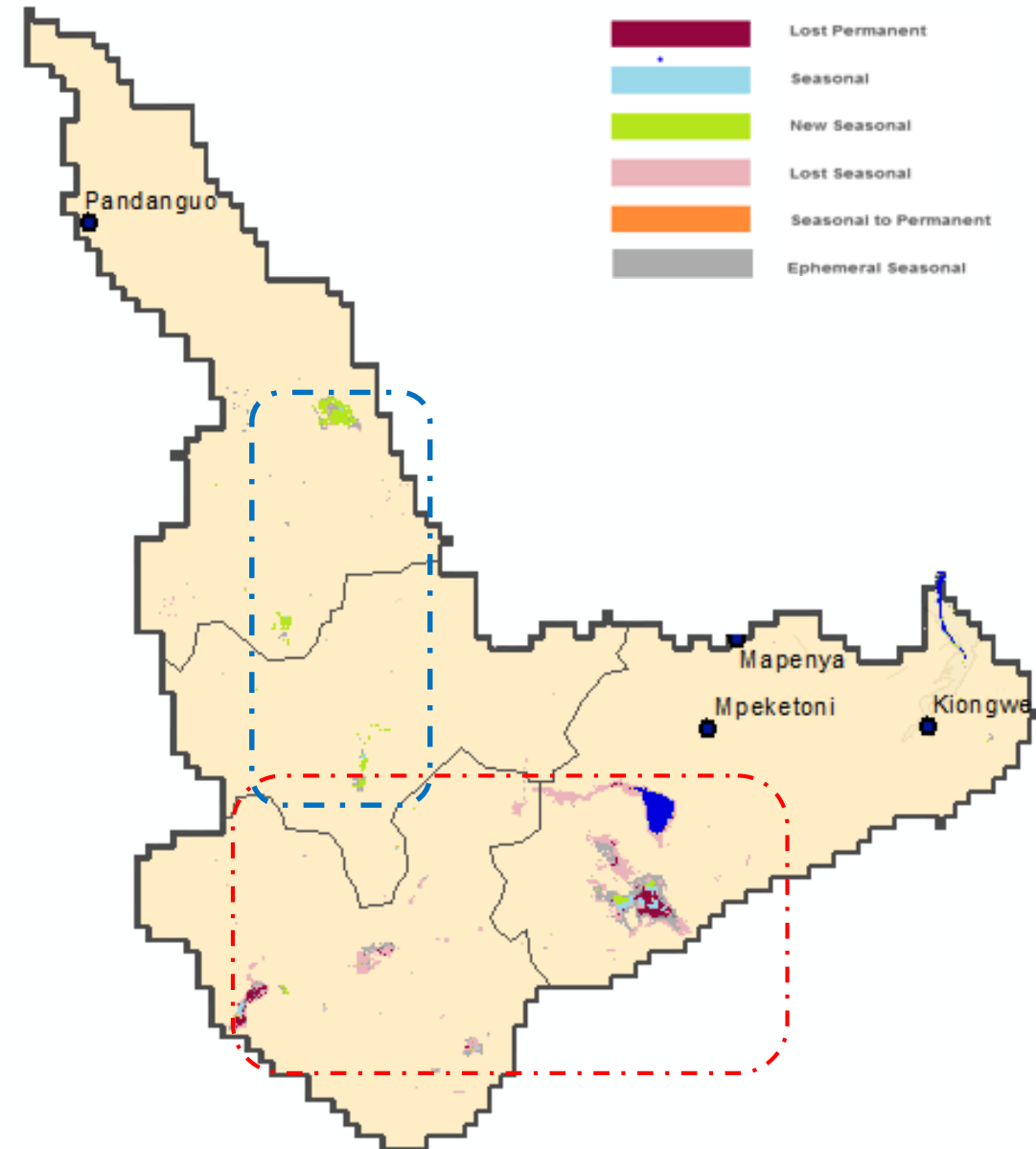
### Average Residence Time (the ratio between total lake volume ('Vol\_total') and average long-term discharge ('Dis\_avg')):

30.5 days

### Watershed area: 436.7km<sup>2</sup> (Area of the watershed associated with the lake, in square kilometers)

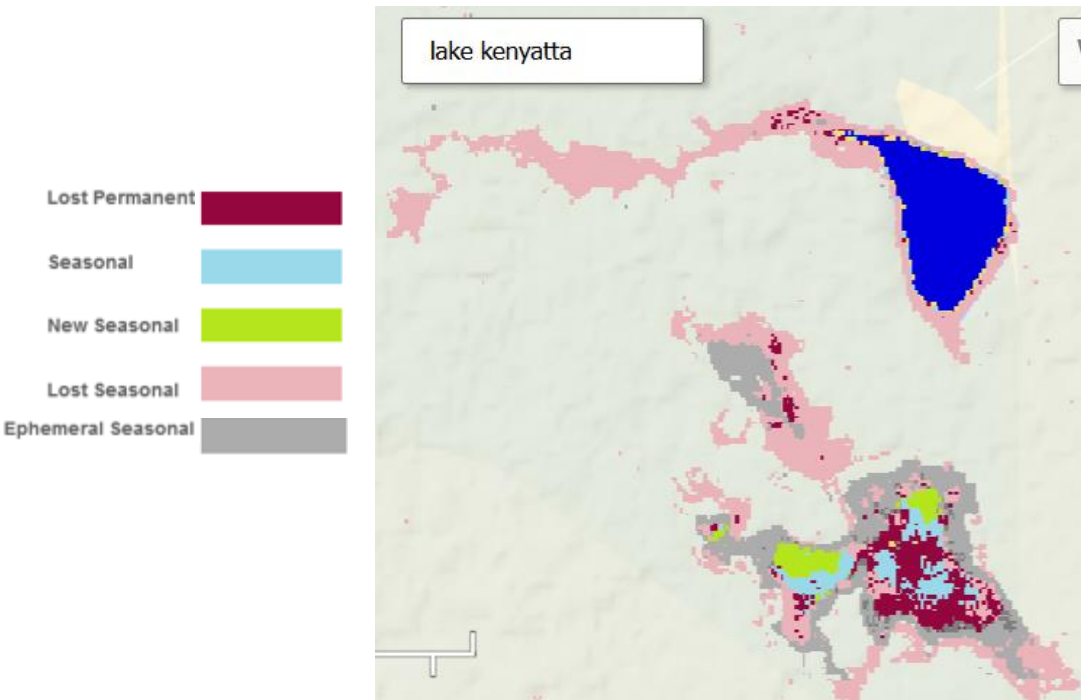
### Changes in Lake Kenyatta Extent:

1990:	2.3 sq.km
2000:	1.8 sq.km
2015:	1.3 sq.km

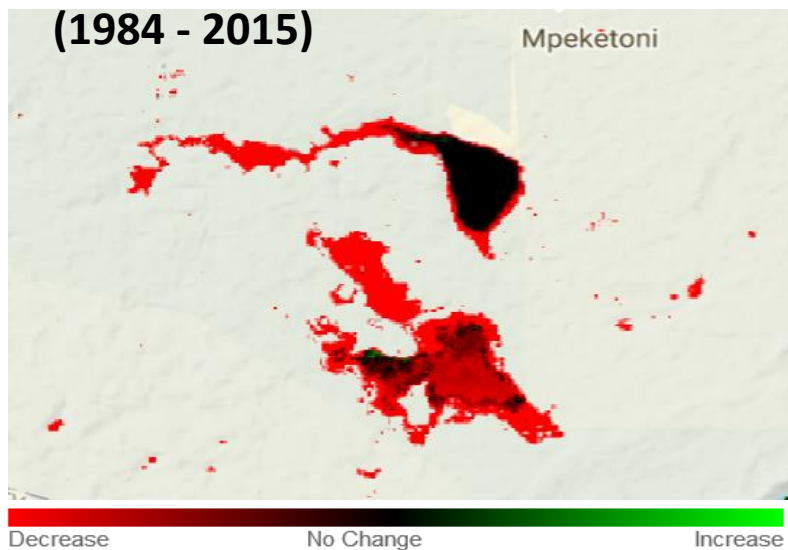


# Water transitions (1984 - 2015)

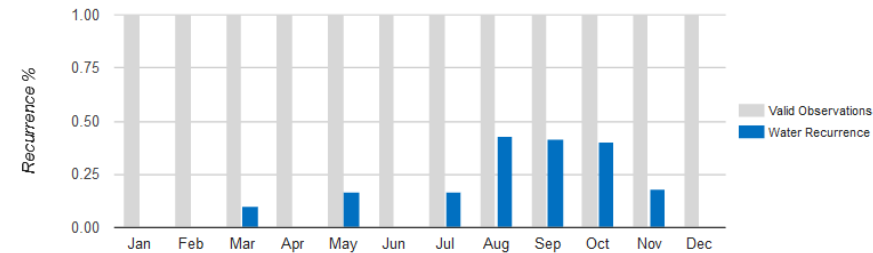
Pixel Coordinates: Lat: -2.408199, Long: 40.672660



## Water Occurrence Change Intensity (1984 - 2015)

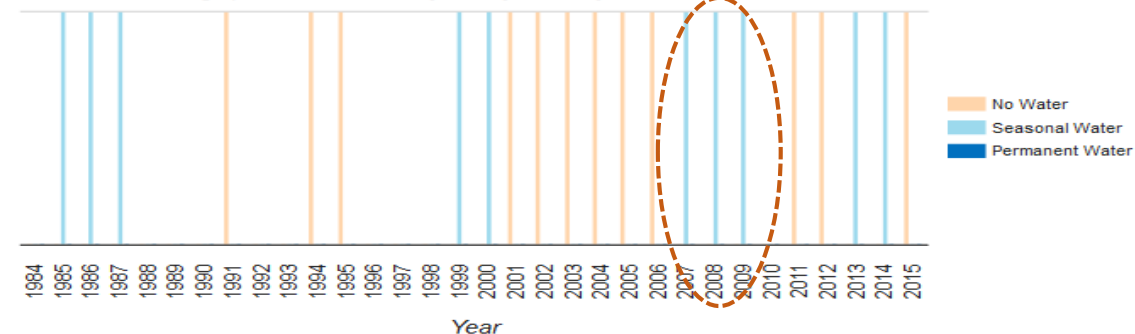


## Monthly Water Recurrence



## Water History

Click a bar on the graph to see full monthly history for that year



## Changes in Lake Kenyatta Extent:

1990: **2.3** sq.km

2000: **1.8** sq.km

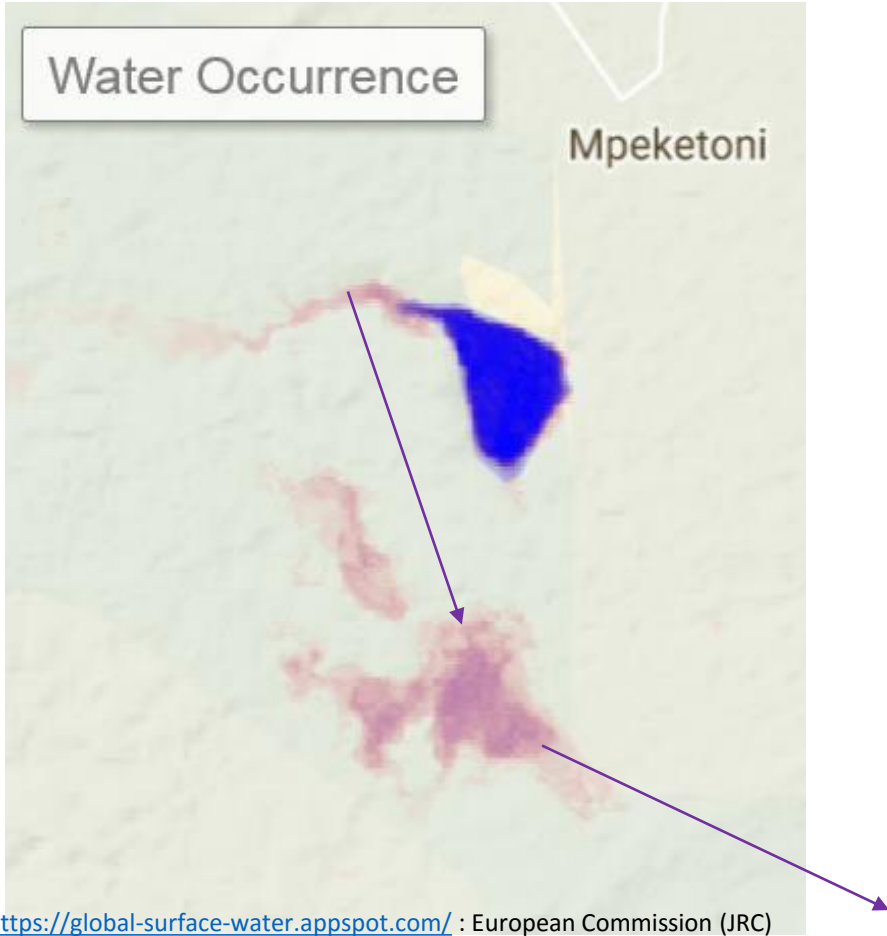
2015: **1.3** sq.km

At this rate , if no appropriate measures are taken , the lake extent may subsequently shrink/disappear in 12 - 15 years time.

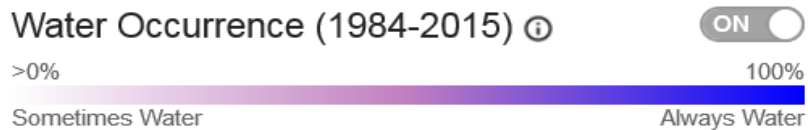
# Water - Recurrence

Pixel Coordinates: Lat: -2.408199, Long: 40.672660

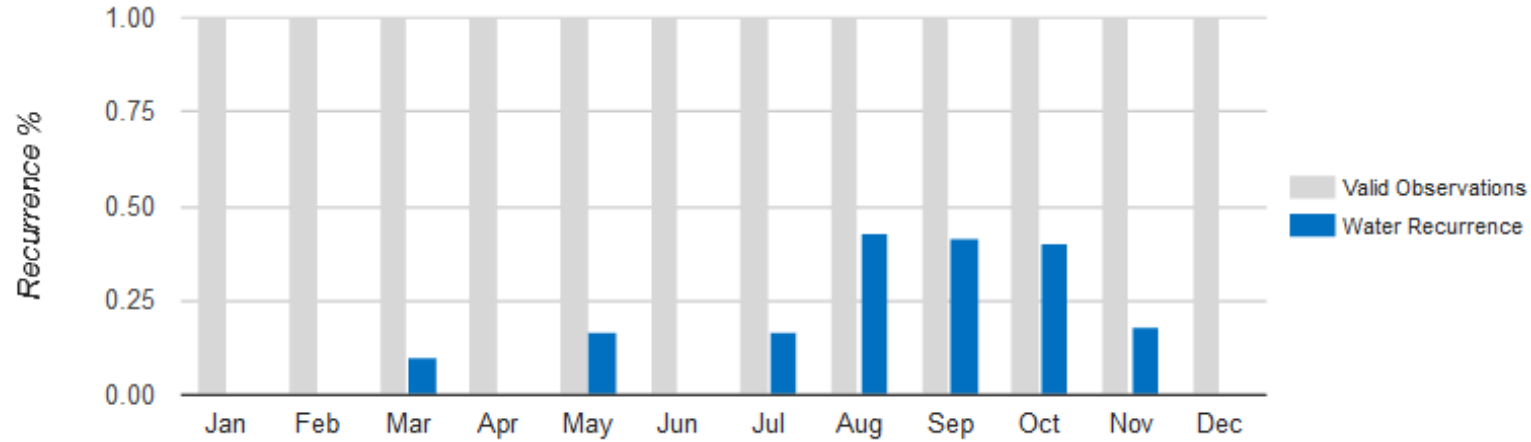
Av. Observations: 400



In 22 years observed: 55% Dry , 45% Seasonal  
 - Acute dryness since 2001 with spells of seasonality influenced by the 2007 El- Nino

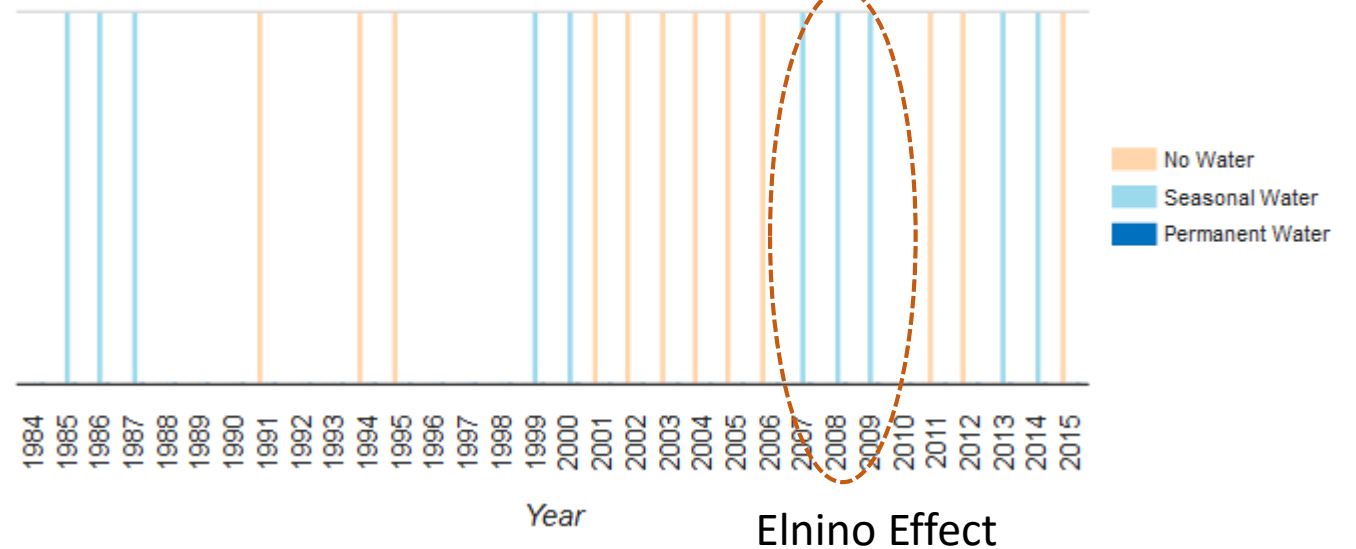


## Monthly Water Recurrence



## Water History

Click a bar on the graph to see full monthly history for that year





## Key Findings

- Deforestation and Loss of Woodland (rife at the core catchment zones)
- Urbanization creating pressure on water demand
- Loss of grasslands might be an indicator to overgrazing in the catchment and has a direct influence on wetland degradation
- Growing food demand (expansion of cropping into riparian lands (wetlands/lake) has massive implications on catchment degradation in the region

## Recommendations

- Restoration of forests targeting catchment management (zonation approaches appropriate)
- Map out water abstraction points within the catchment to inform water balance targeting quality/ quantity/demand to be carried out in the catchment. This should be backed by proper hydrologic assessment of the lake /catchment with key stakeholders like WARMA involved.
- Sustainable agricultural practice (best practice) e.g. pasture zonation, sustainable cropping techniques to be advocated for.