

Lake Kyoga, Uganda

by

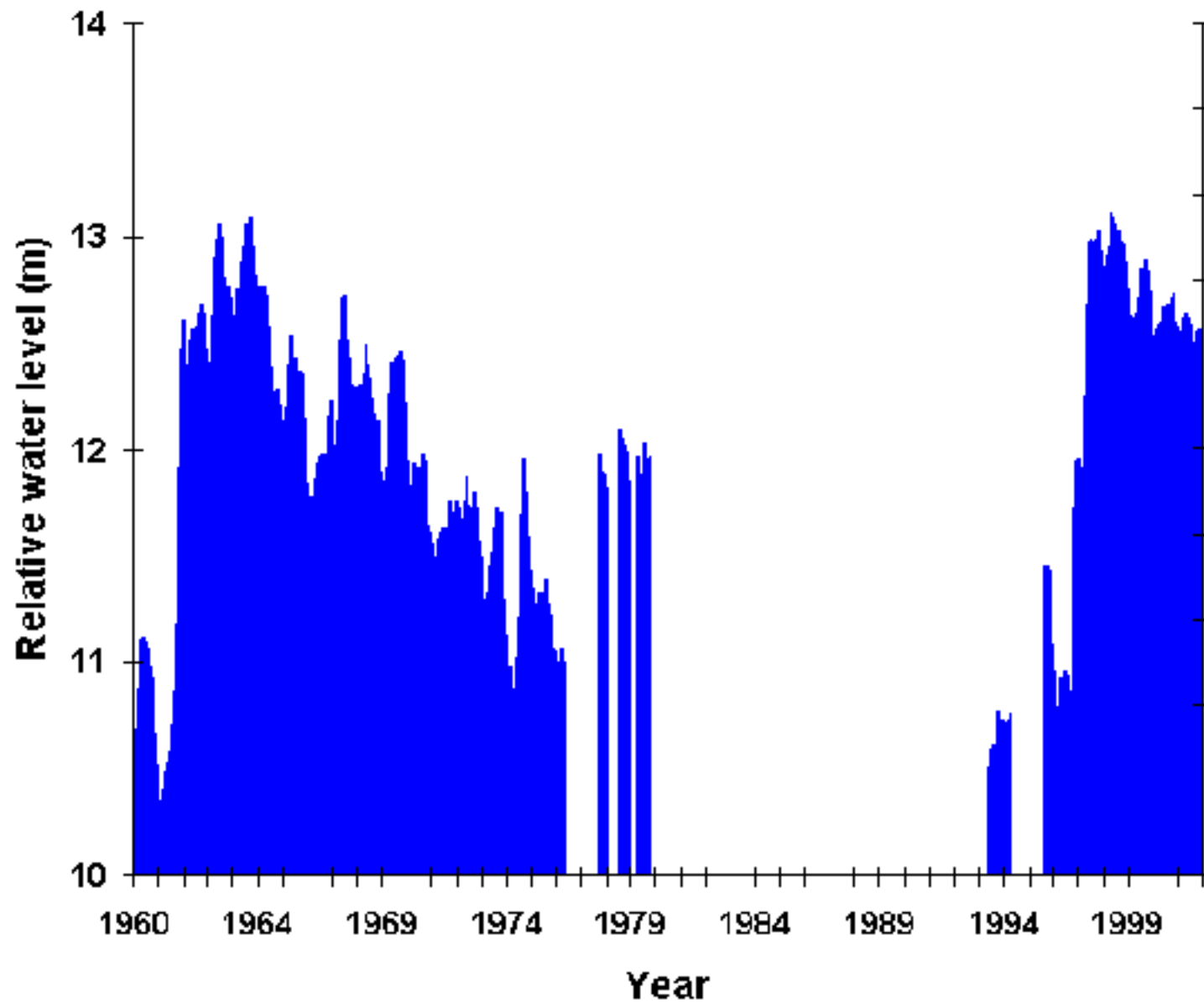
Thomas Gumbrecht



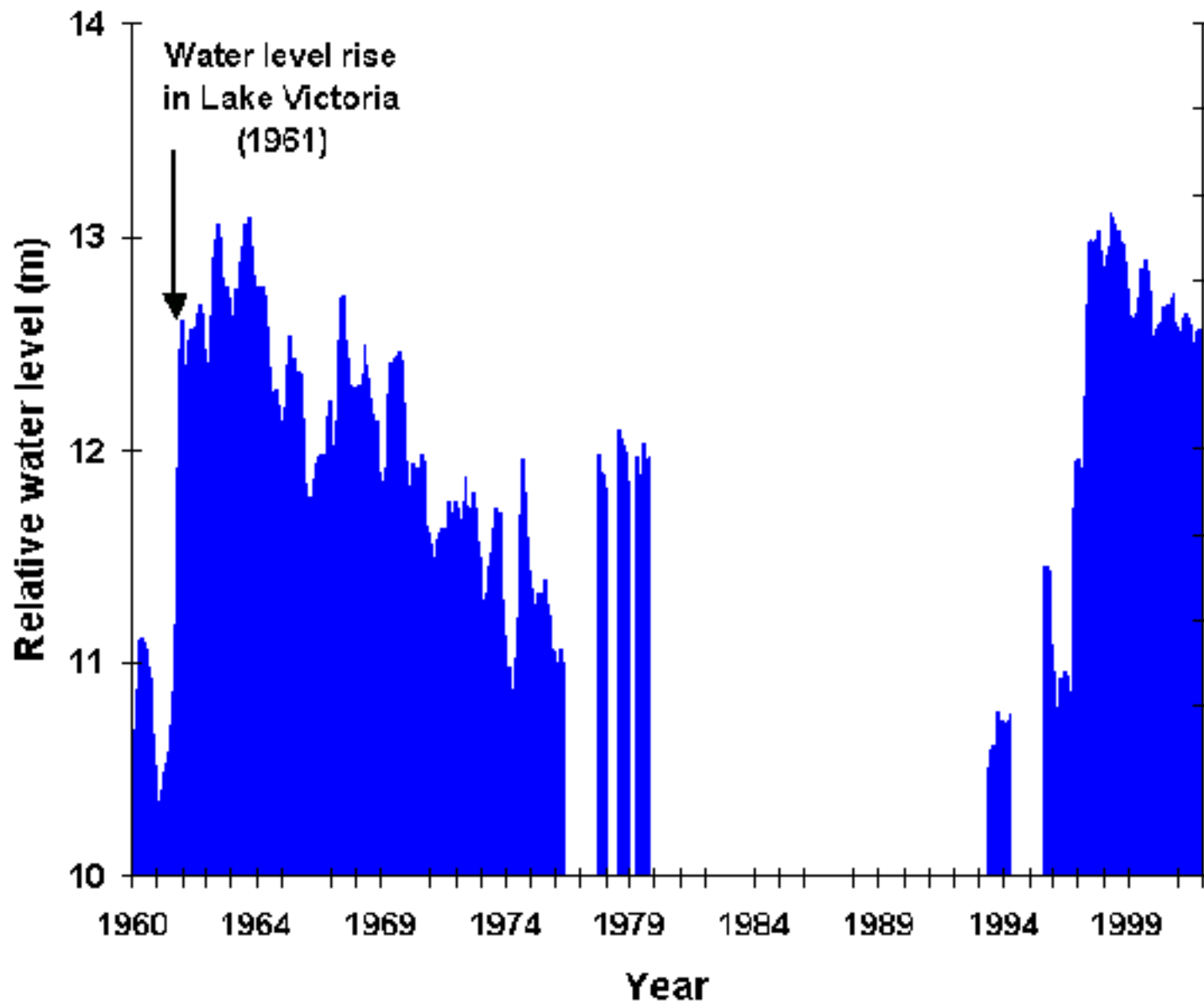
Lake Kyoga in Uganda has experienced large variations in water levels in the past.

How does this translate into Lake area, and how does it affect the people and the resources in and around the Lake?

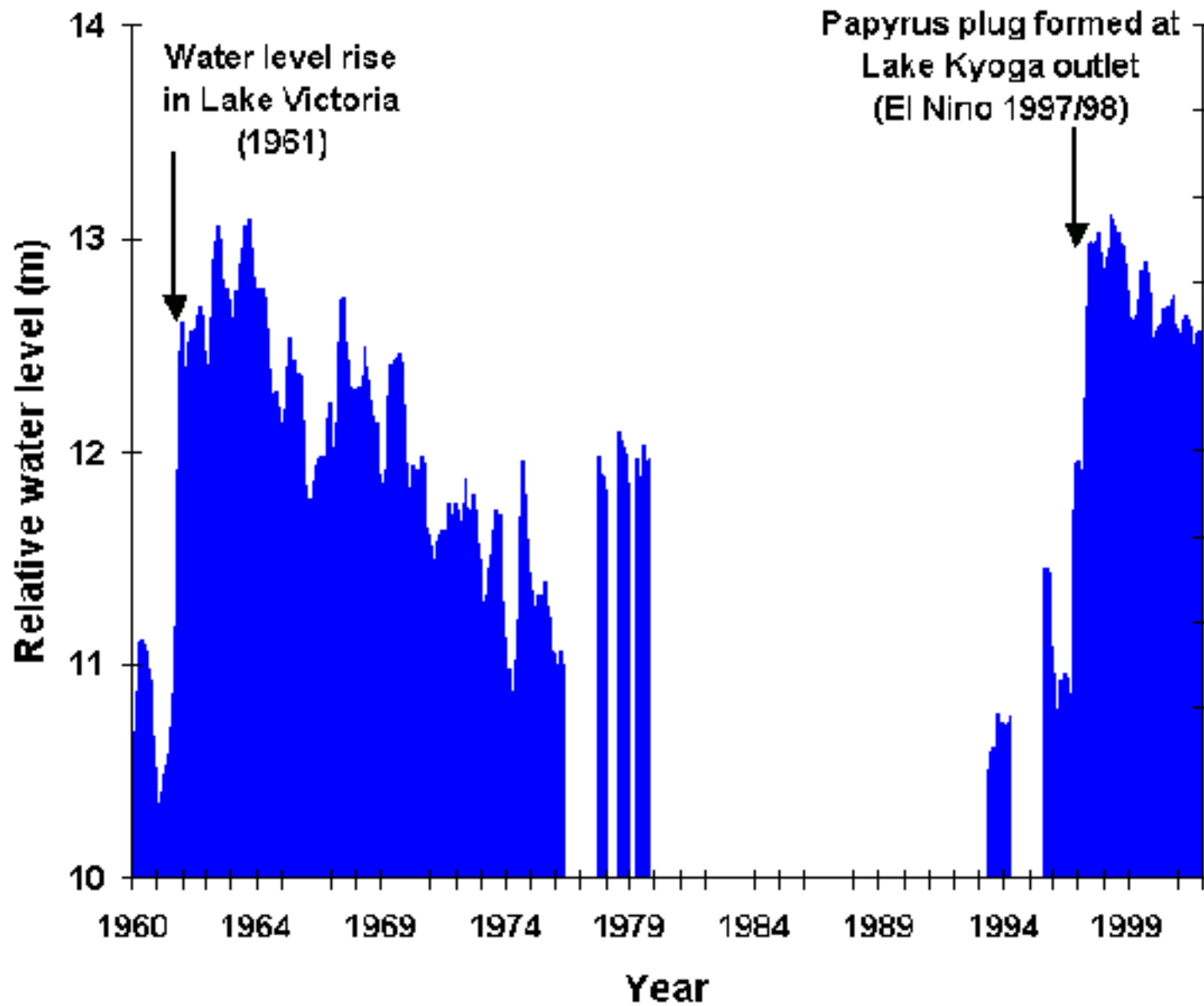
Relative water levels of Lake Kyoga, Uganda, 1960 - 2002



Relative water levels of Lake Kyoga, Uganda, 1960 - 2002



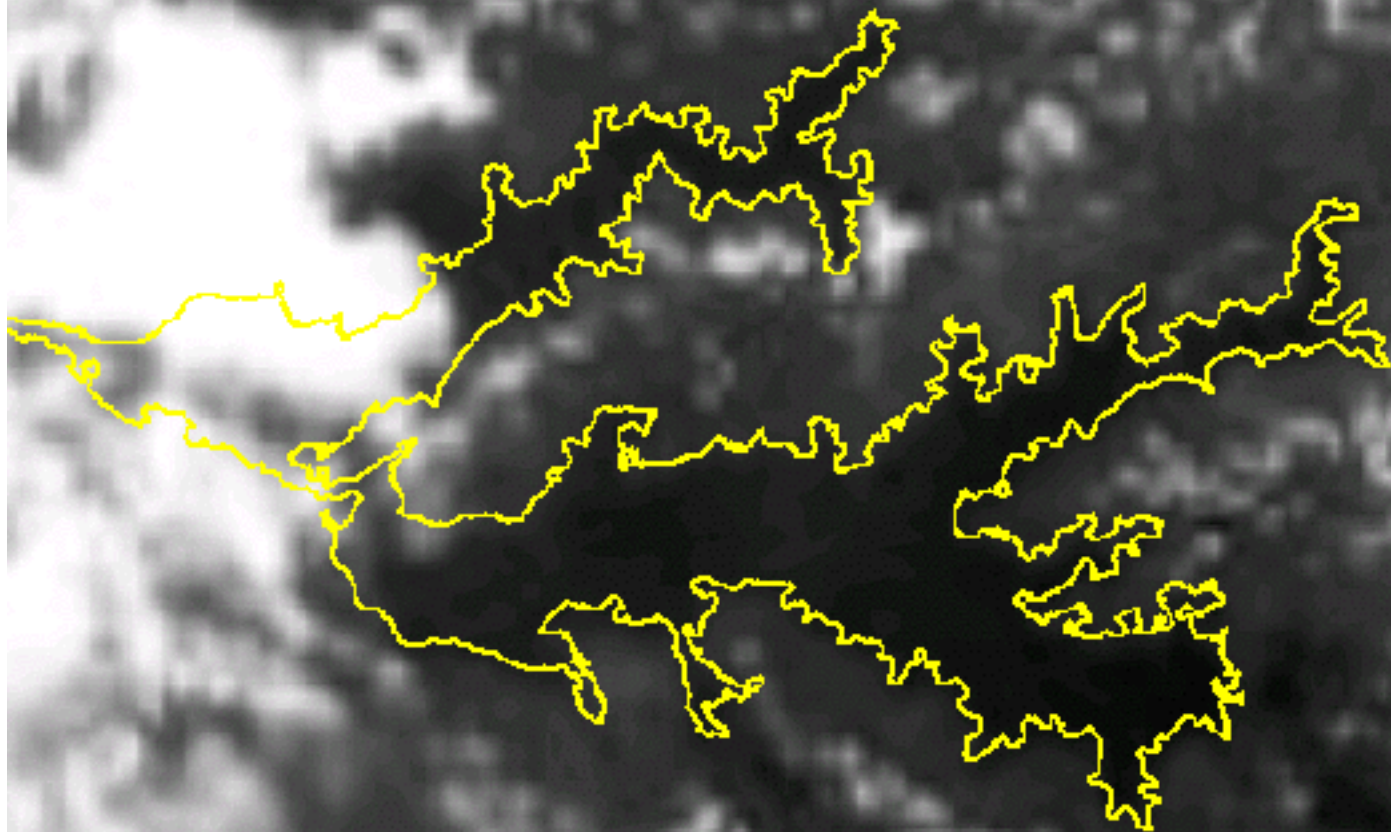
Relative water levels of Lake Kyoga, Uganda, 1960 - 2002



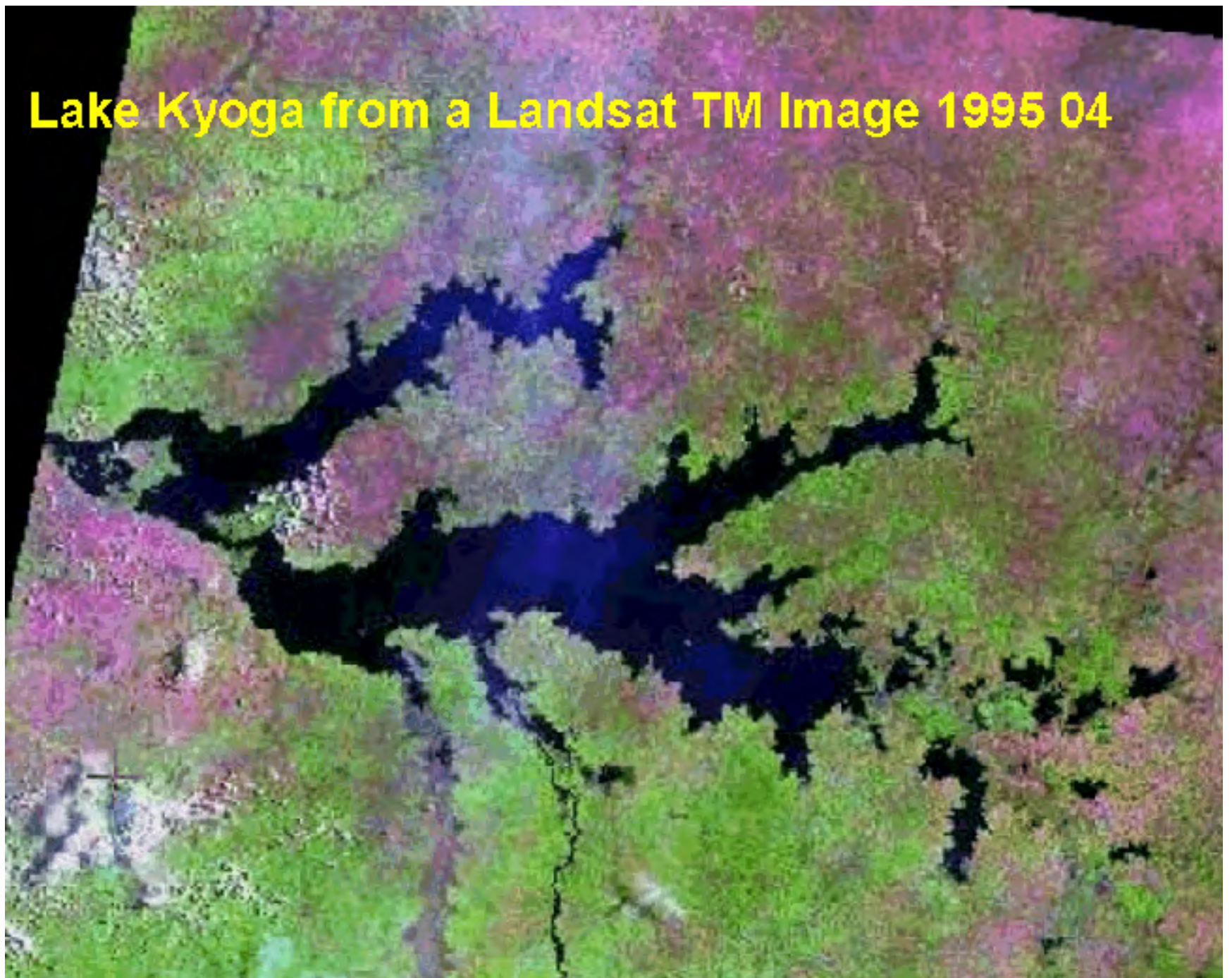
Lake Kyoga from a Corona Image 1963 10



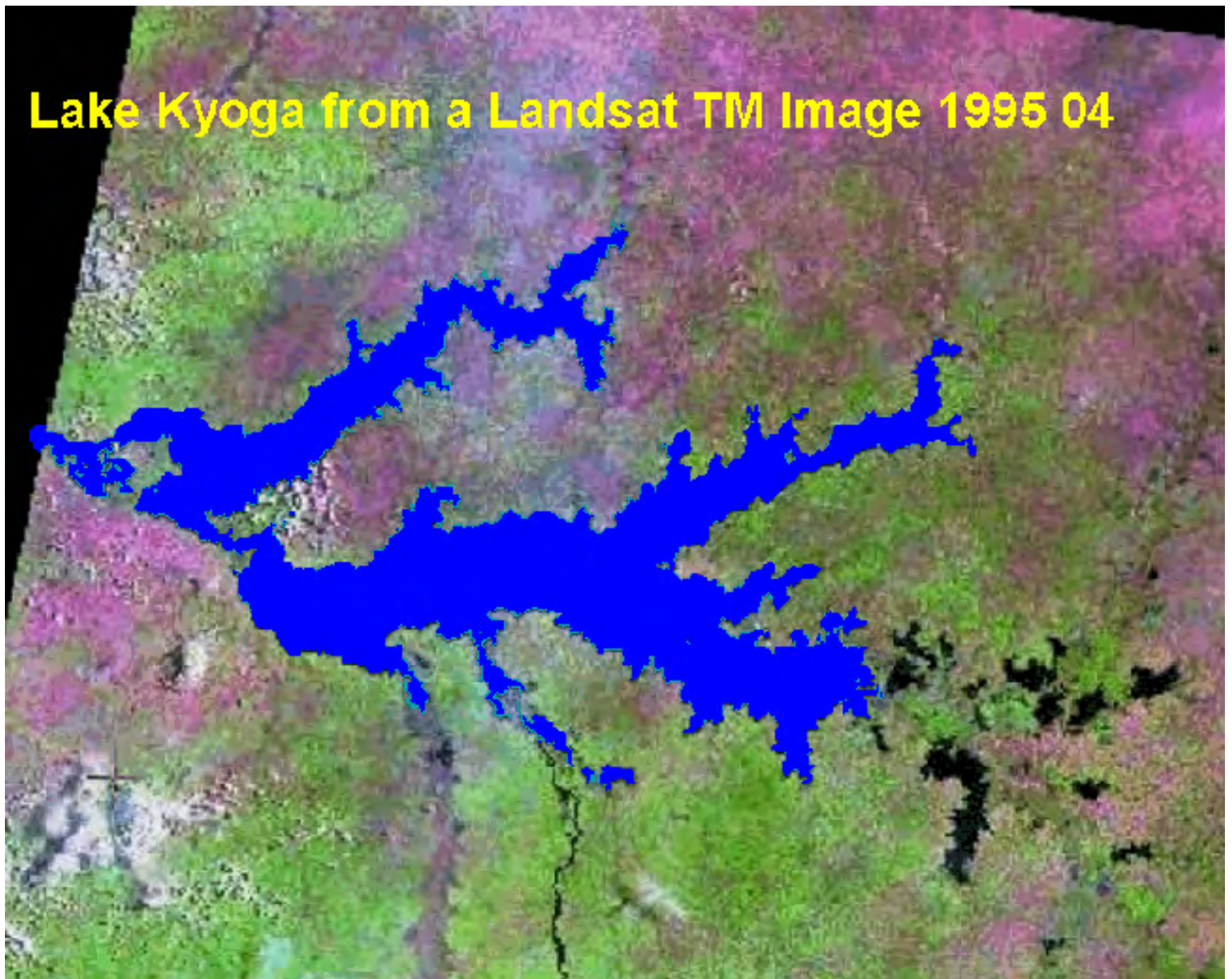
Lake Kyoga from a Corona Image 1963 10



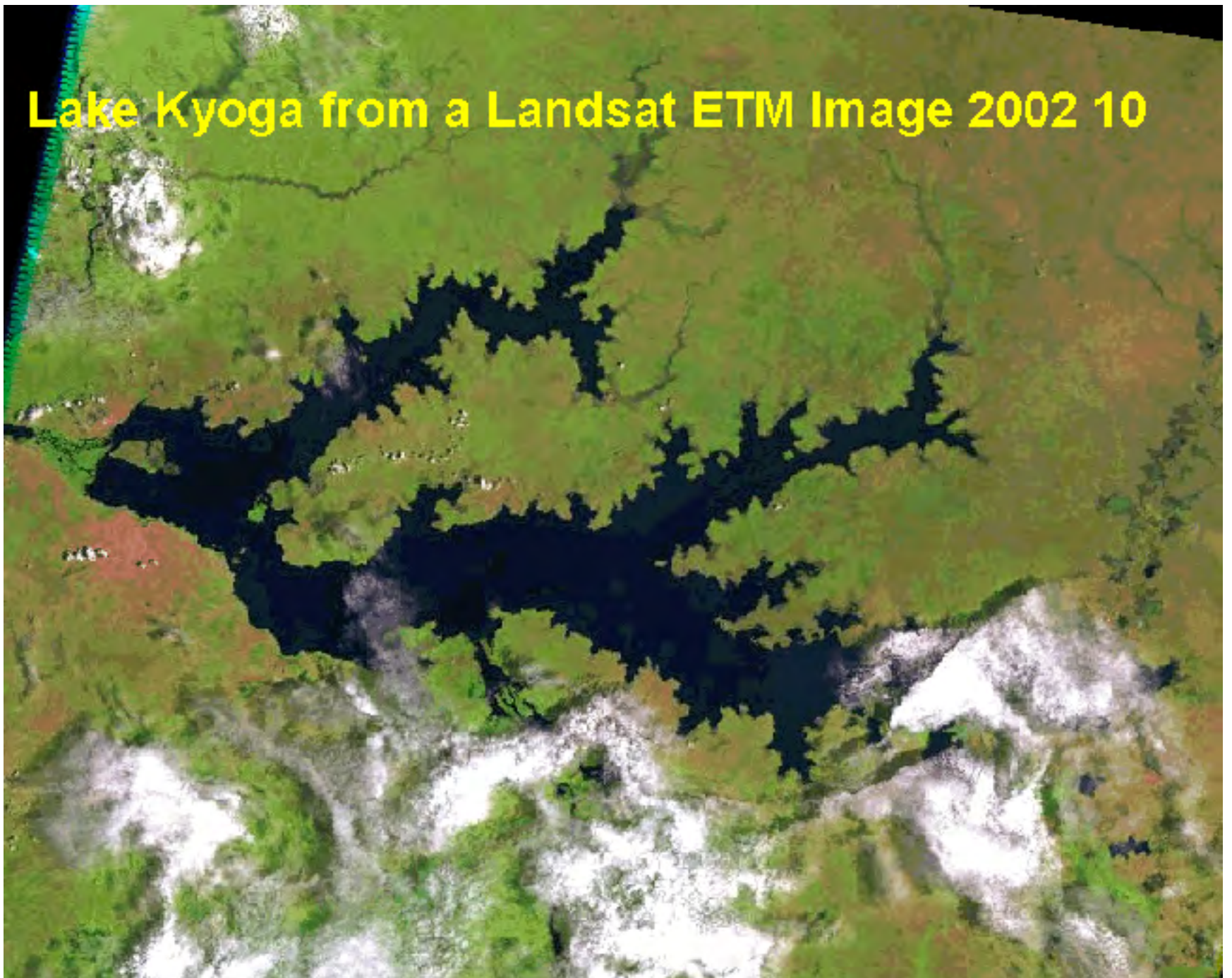
Lake Kyoga from a Landsat TM Image 1995 04



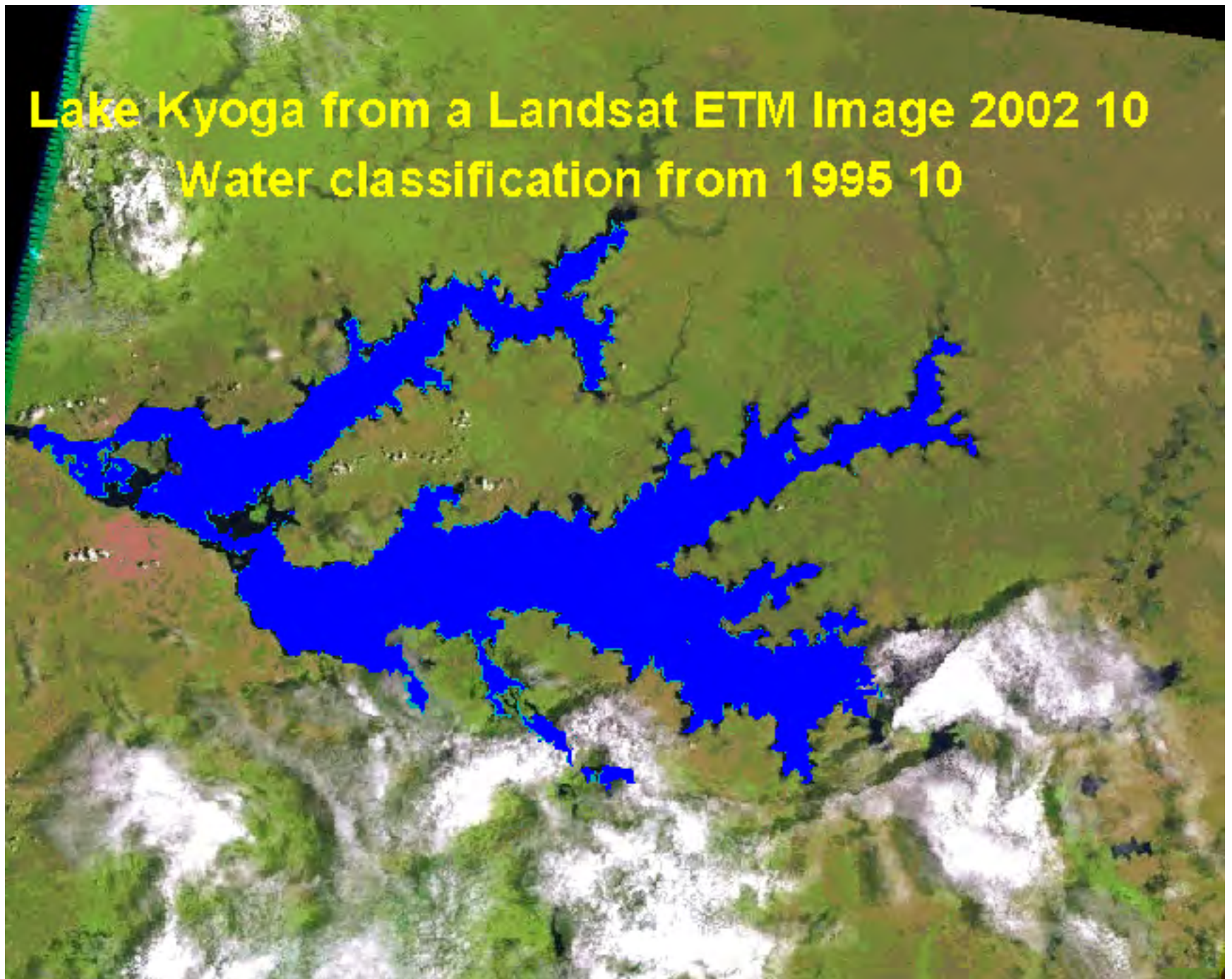
Lake Kyoga from a Landsat TM Image 1995 04



Lake Kyoga from a Landsat ETM Image 2002 10



Lake Kyoga from a Landsat ETM Image 2002 10
Water classification from 1995 10

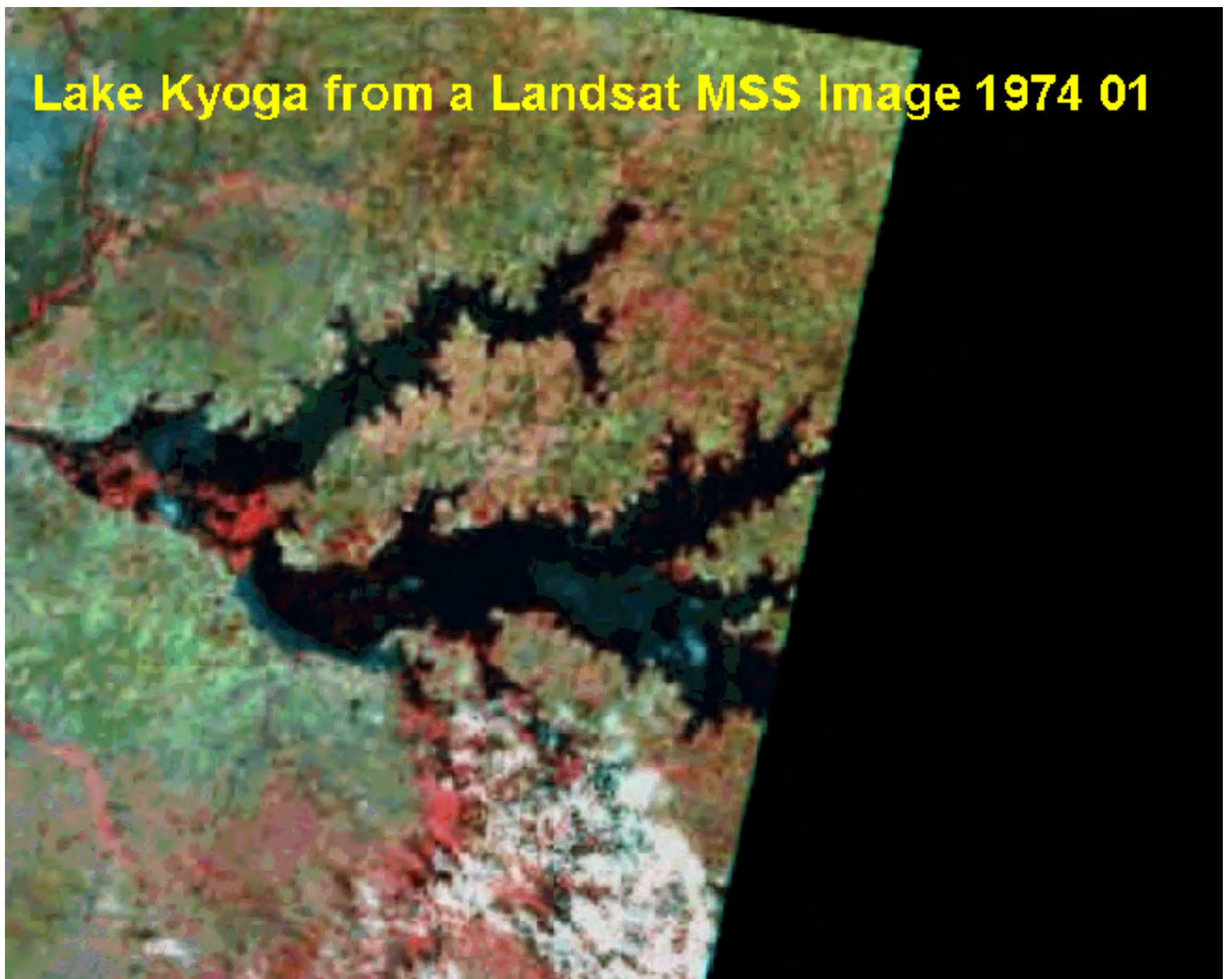




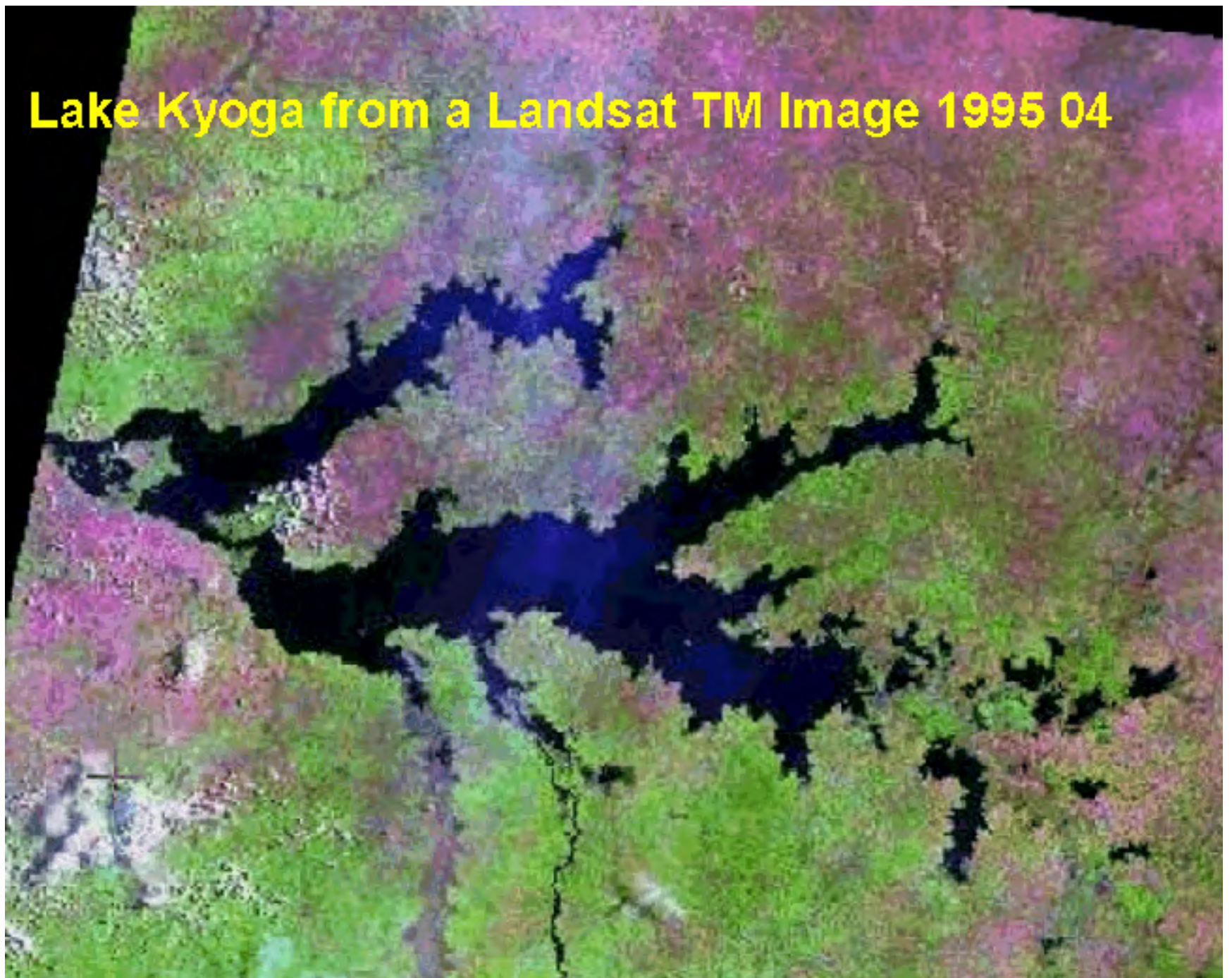
Four image types were used to map the historical area of Lake Kyoga, Uganda

- **Landsat MSS (MultiSpectral Scanner)**
- **Landsat TM (Thematic Mapper)**
- **Landsat ETM (Enhanced TM), and**
- **JERS SAR radar**

Lake Kyoga from a Landsat MSS Image 1974 01



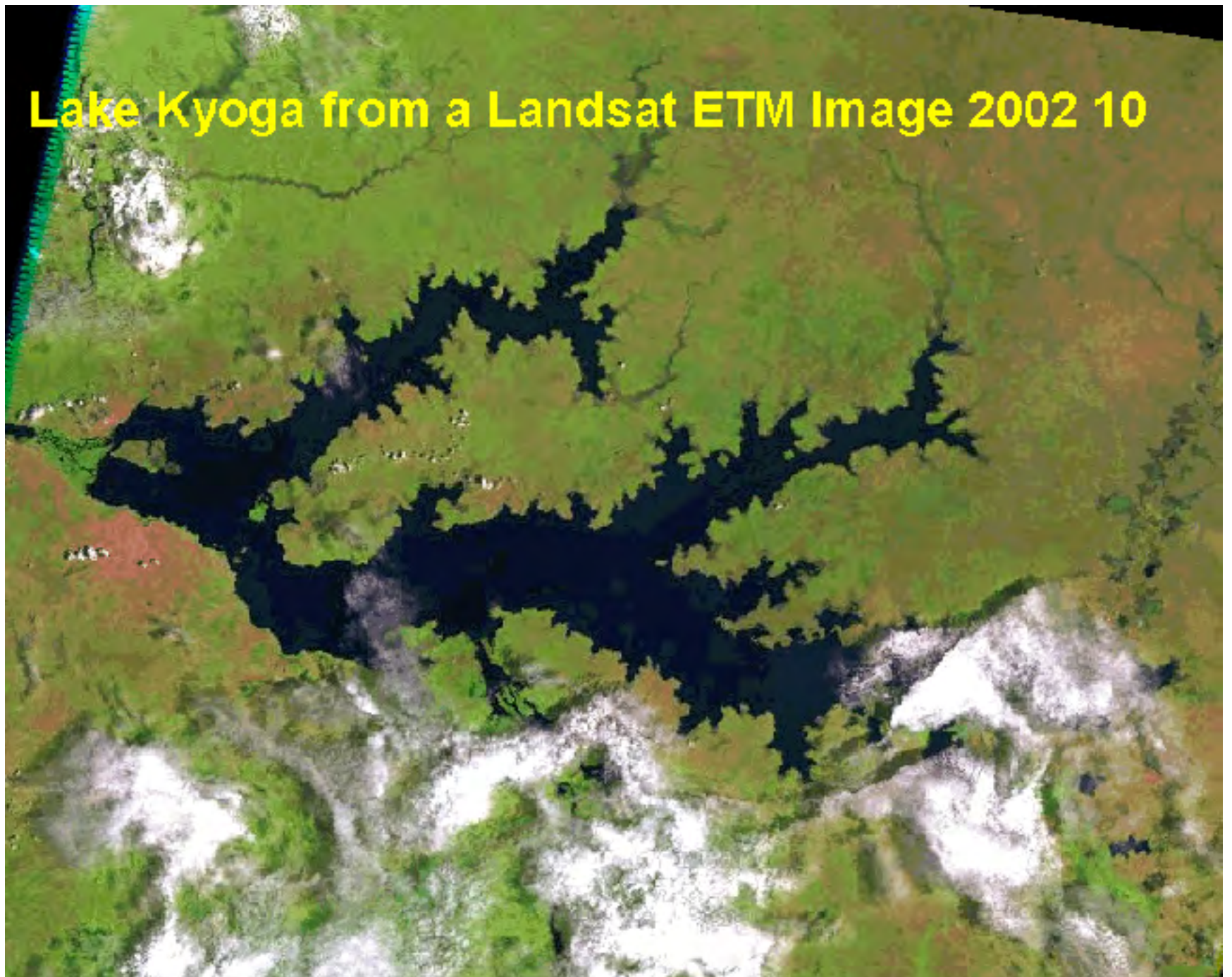
Lake Kyoga from a Landsat TM Image 1995 04



Lake Kyoga from a JERS radar image 1996 03



Lake Kyoga from a Landsat ETM Image 2002 10



A grayscale satellite image of a coastal region, likely a tropical area, showing a mix of land, water, and clouds. A grid of small squares is overlaid on the image, representing a spatial sampling or classification scheme. The text is overlaid on the left side of the image.

All images were

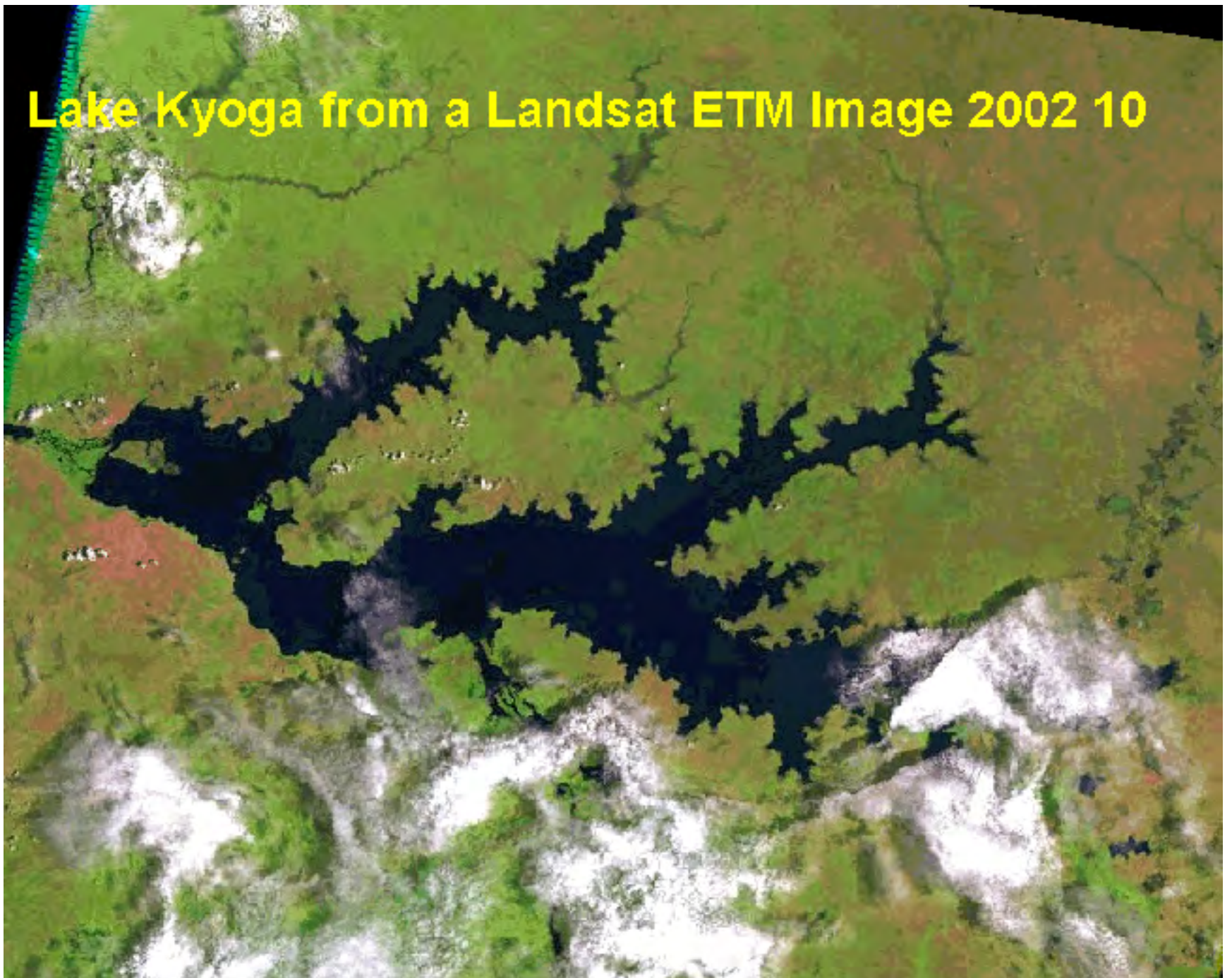
- **Geocorrected**

- **Resampled to a resolution of 250 m**

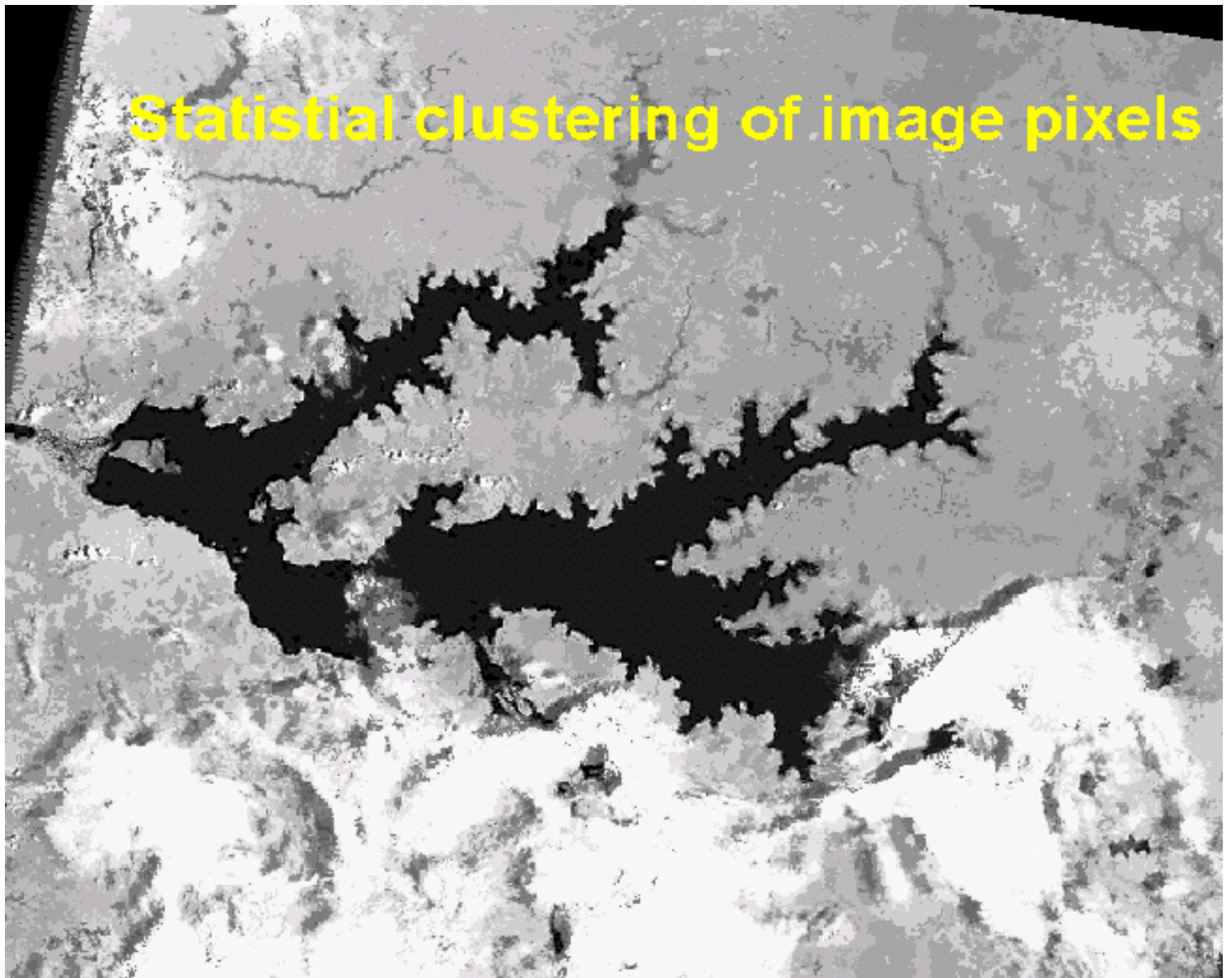
- **Classified to Water, Wetland, Land, Cloud**

- **Areas under cloud were classified from nearby dates with cloudfree conditions**

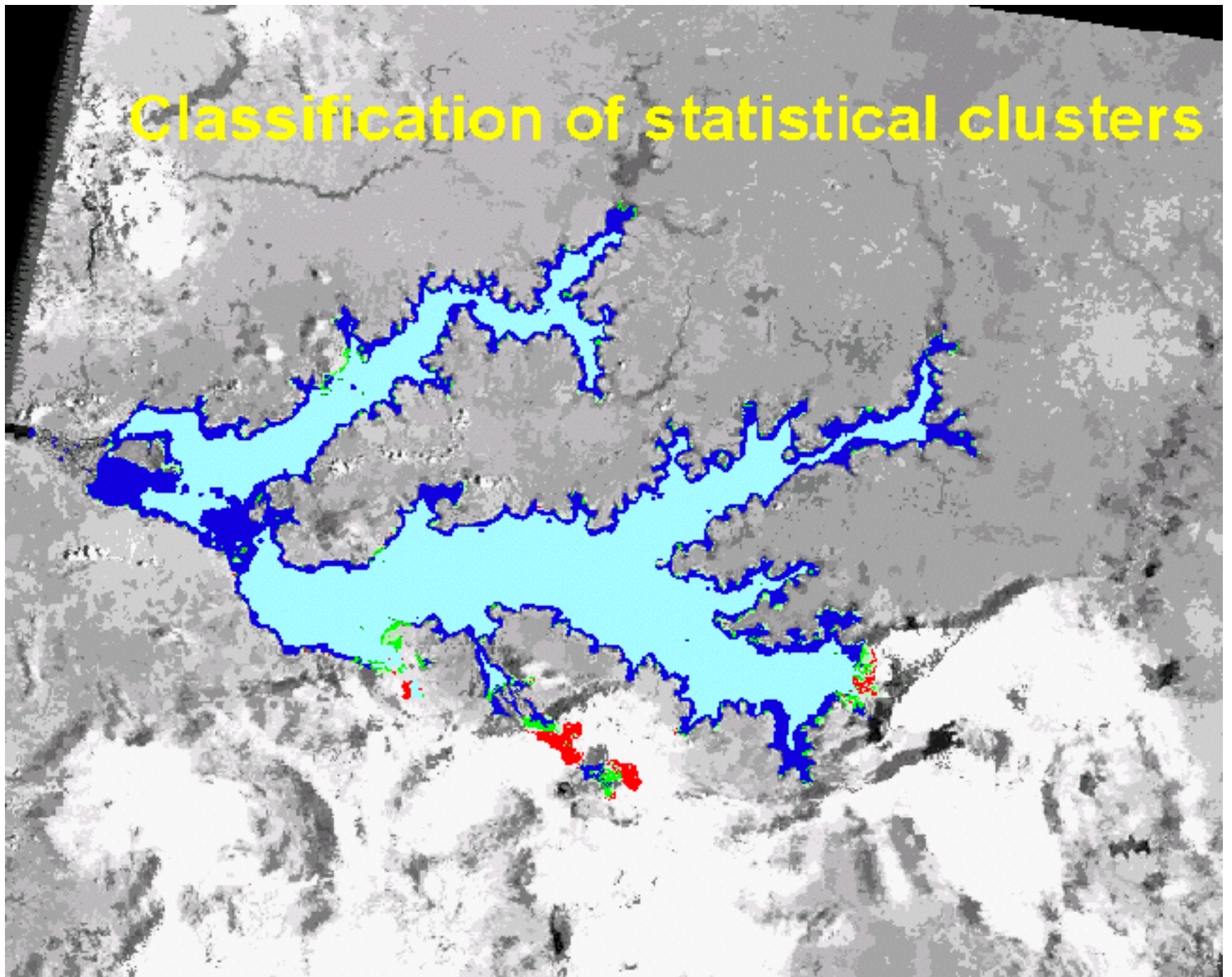
Lake Kyoga from a Landsat ETM Image 2002 10



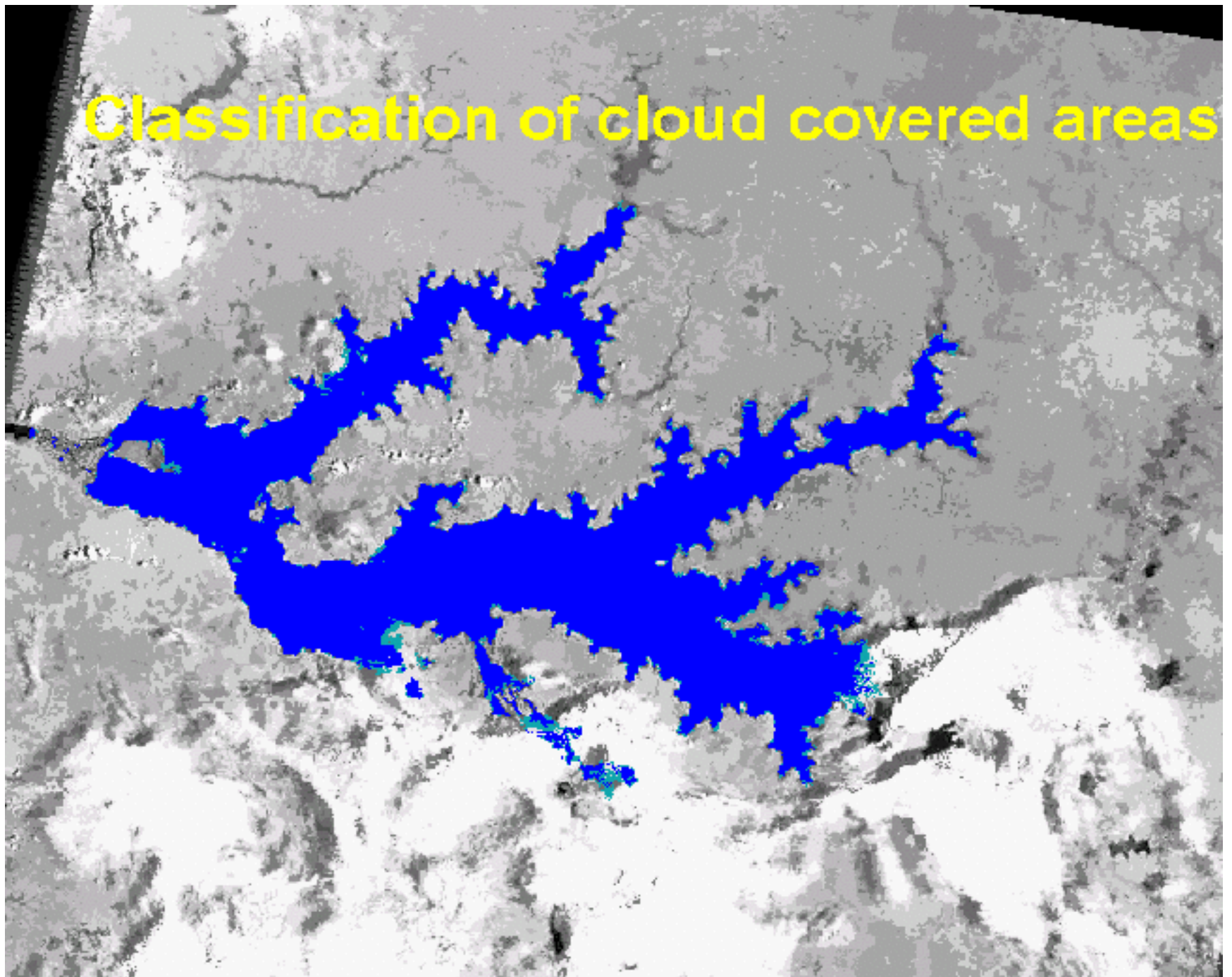
Statistical clustering of image pixels



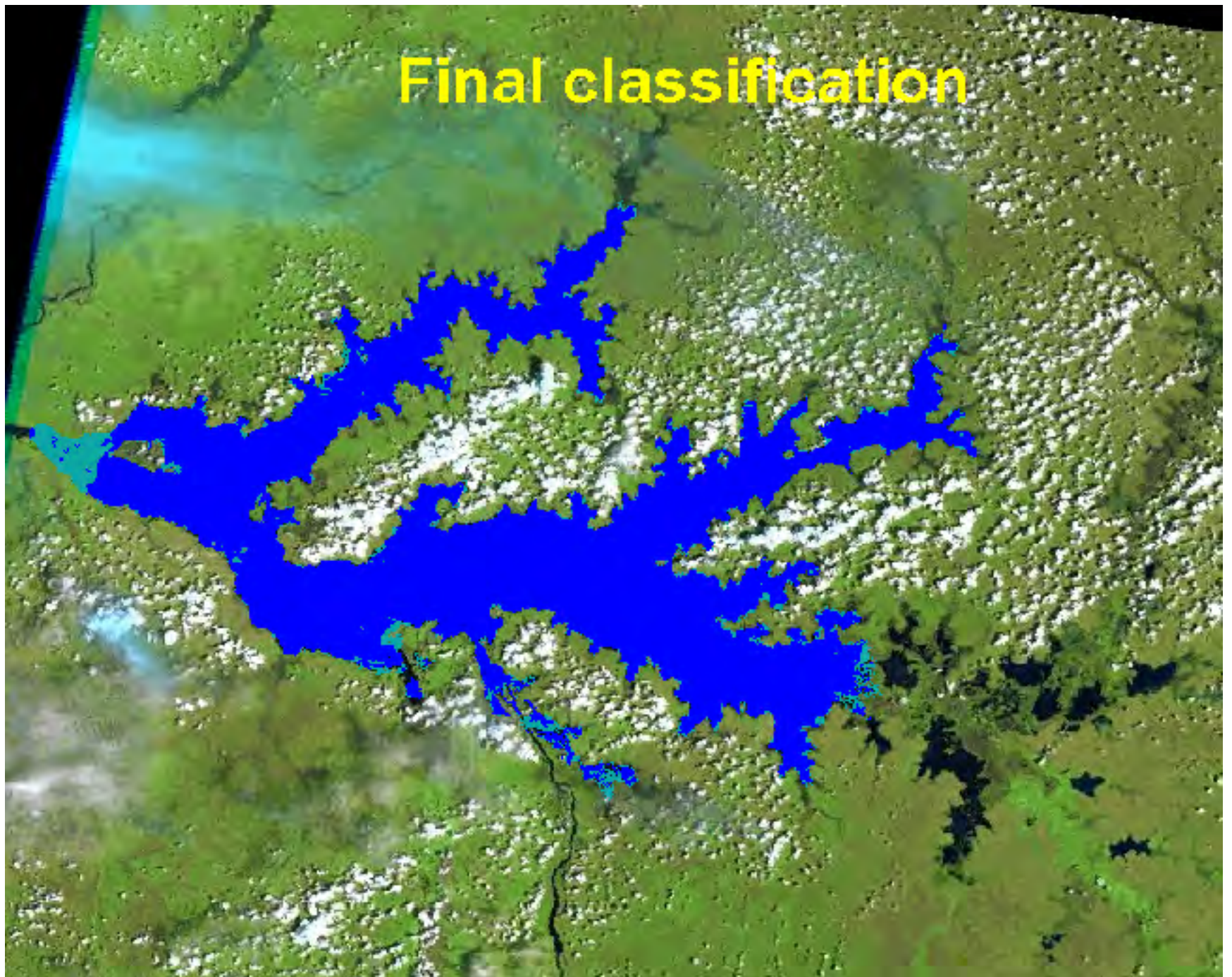
Classification of statistical clusters



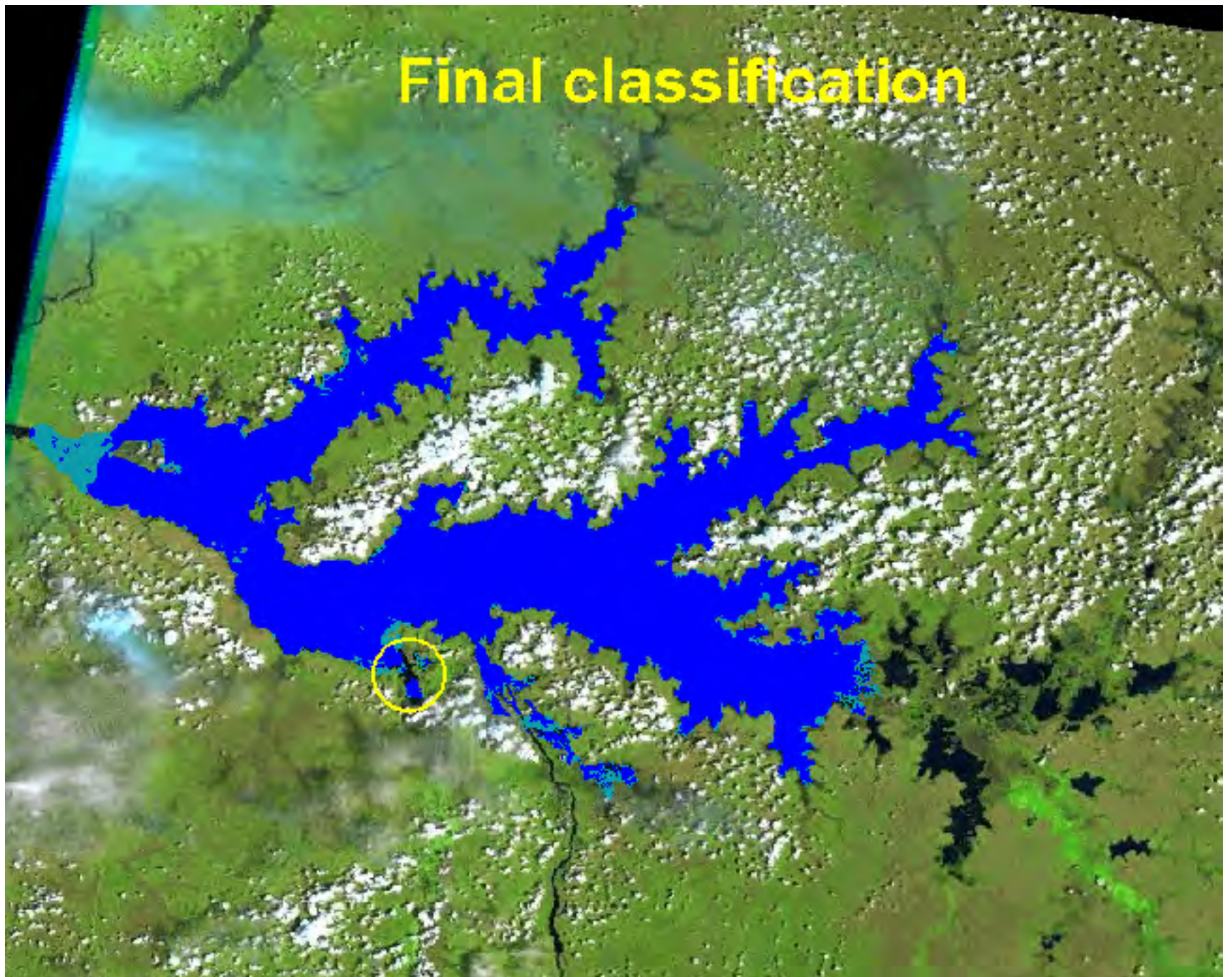
Classification of cloud covered areas



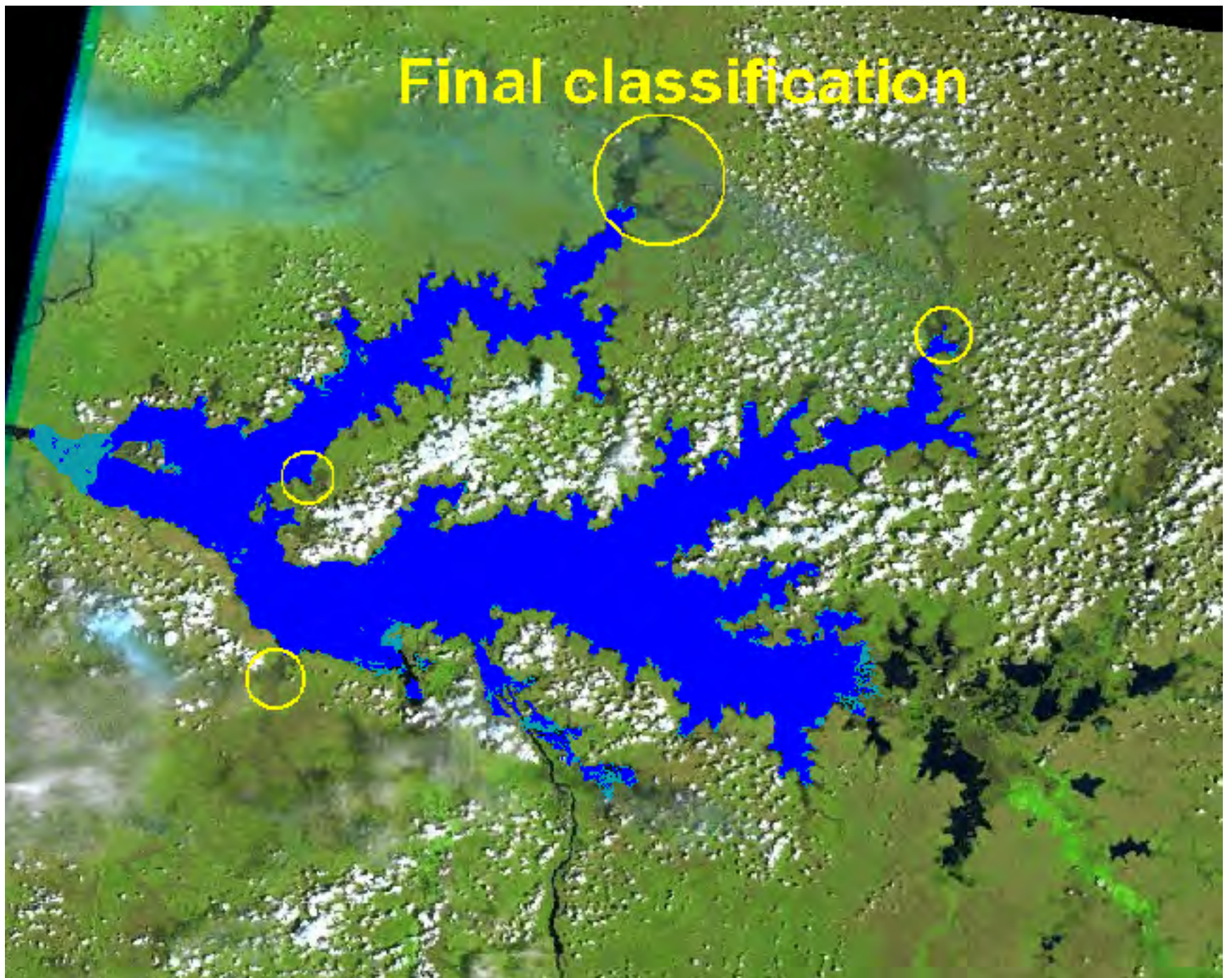
Final classification



Final classification



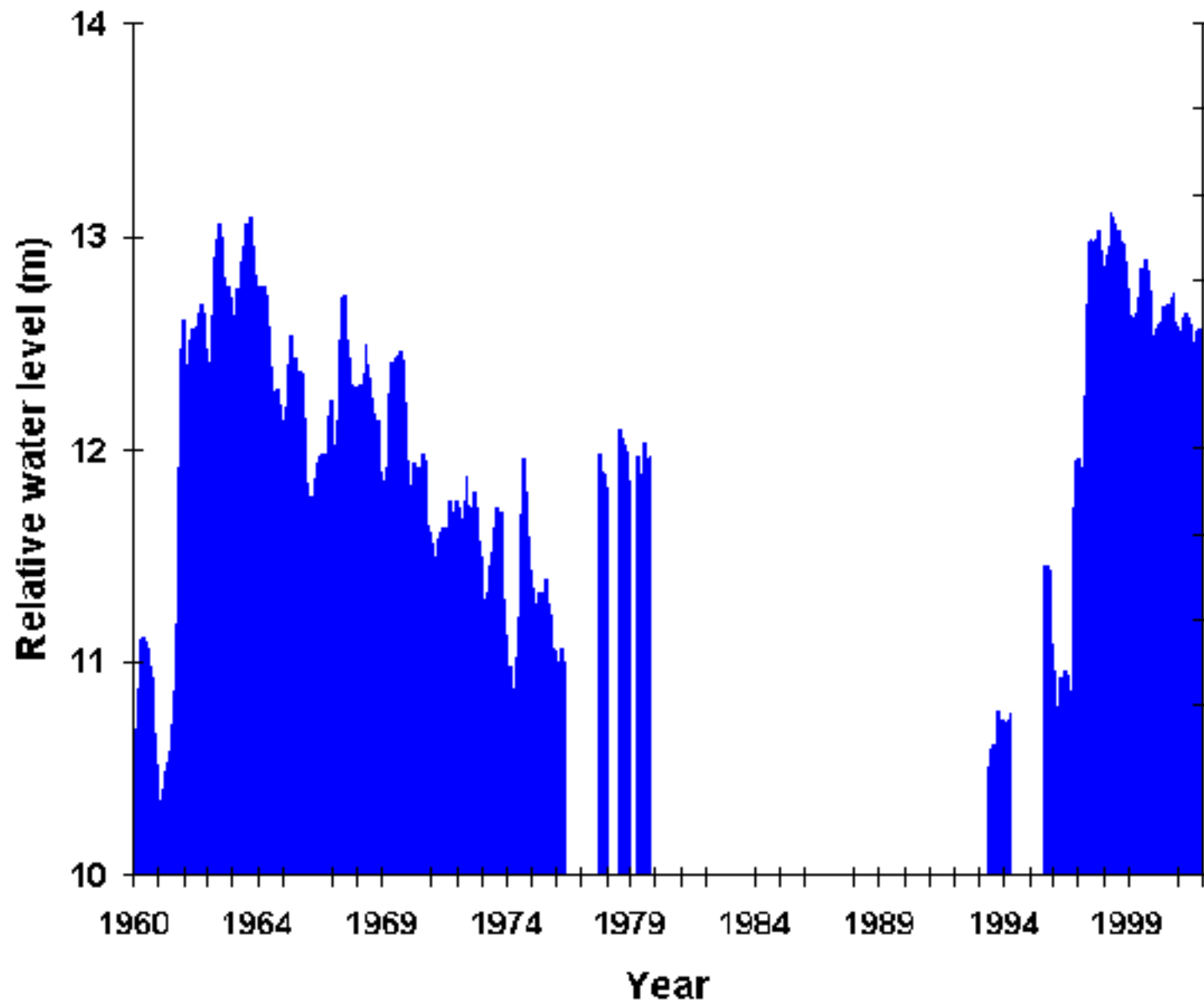
Final classification



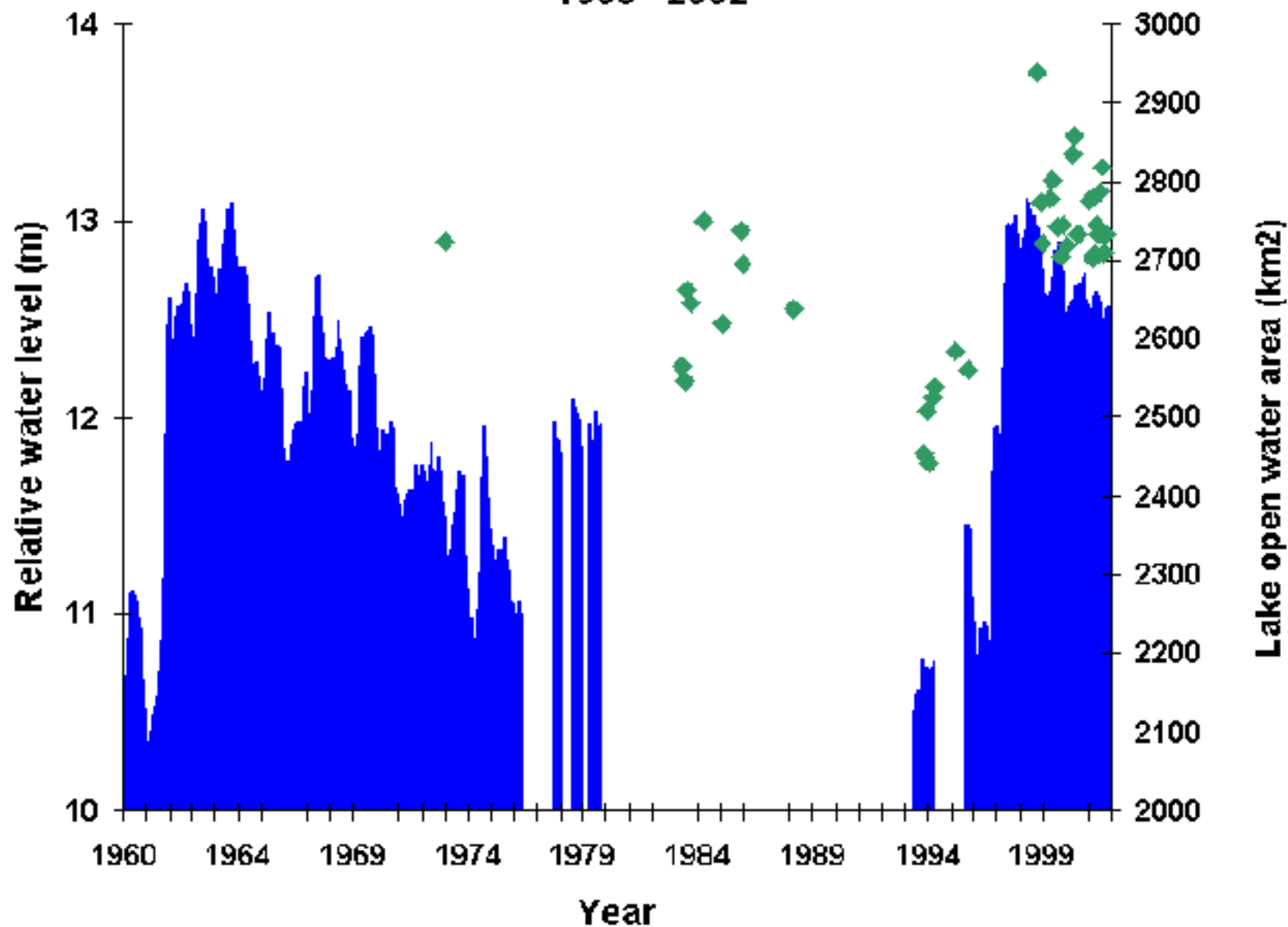


**For Thomas to remember to show the next
movie clip!**

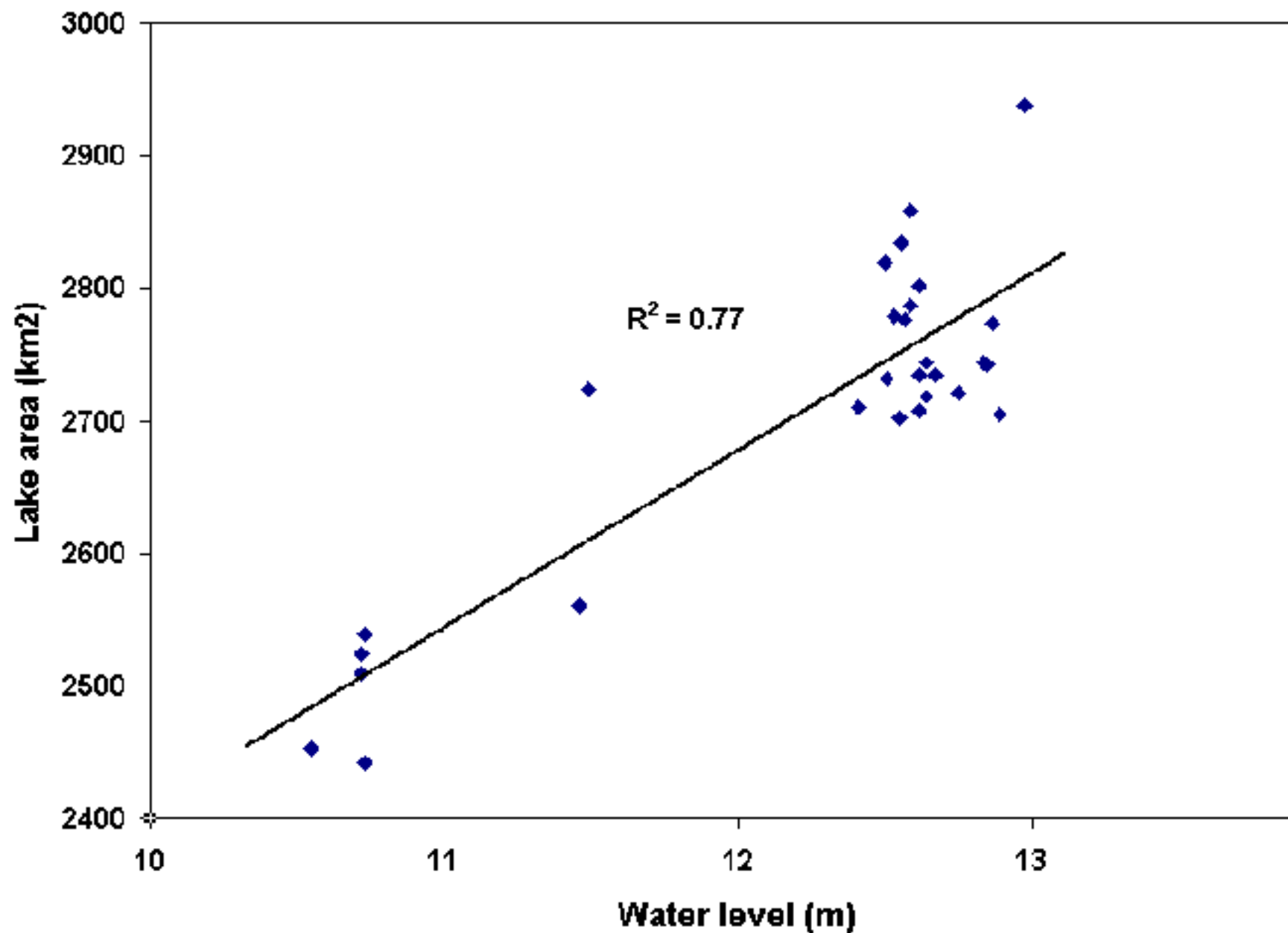
Relative water levels of Lake Kyoga, Uganda, 1960 - 2002



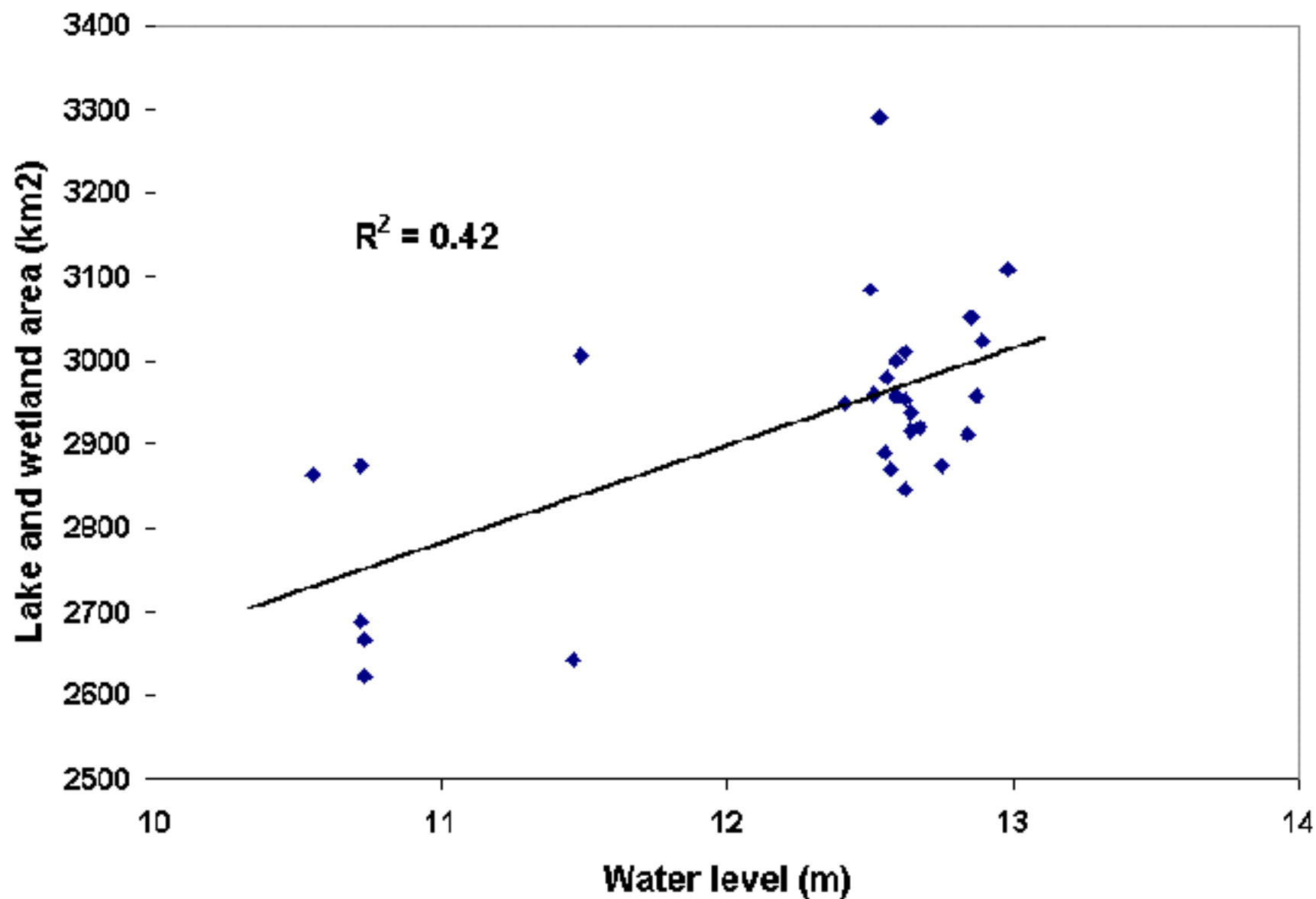
**Relative water levels and Lake area of Lake Kyoga, Uganda,
1960 - 2002**

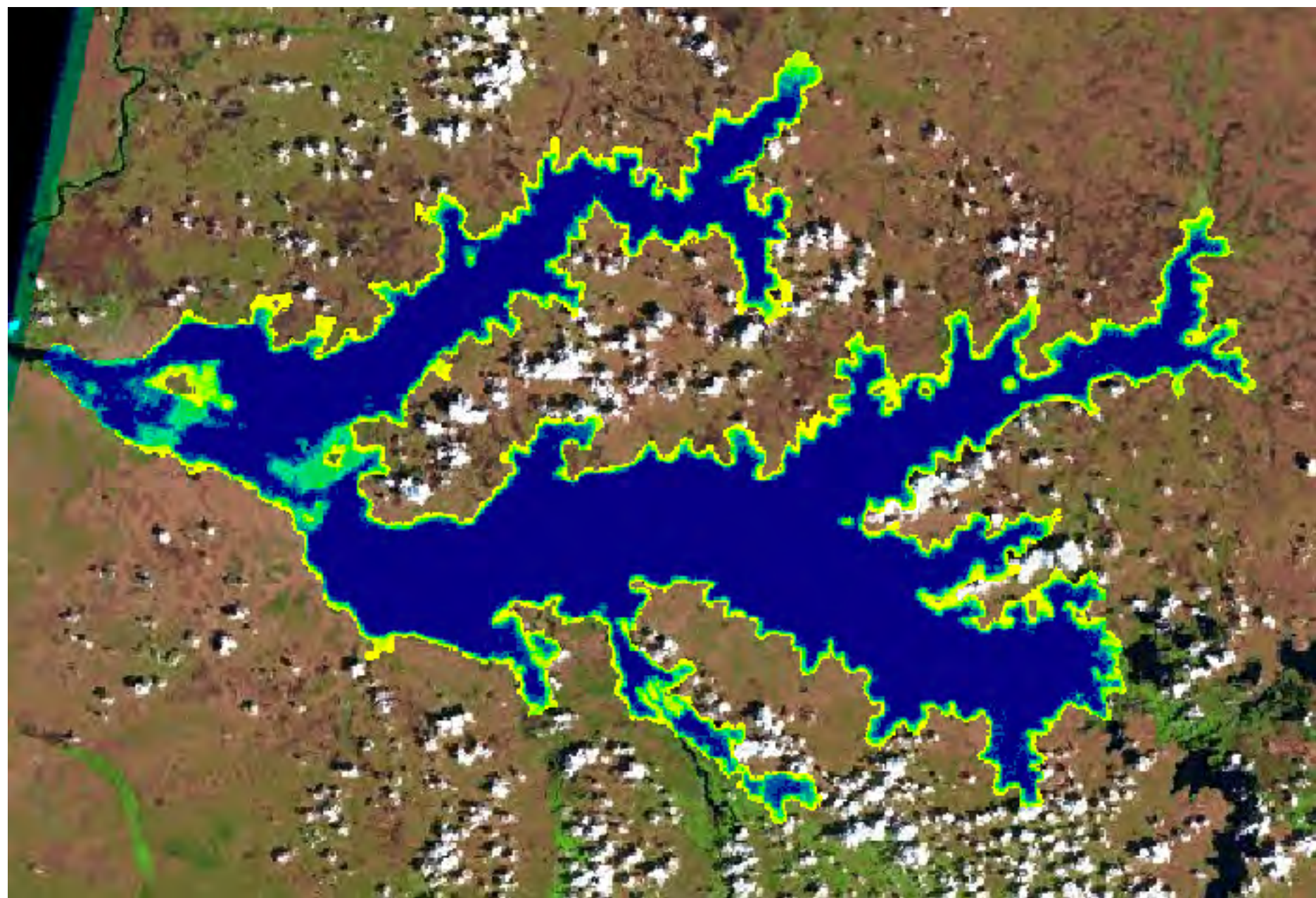


Relative waterlevel and open Lake area of Lake Kyoga, Uganda

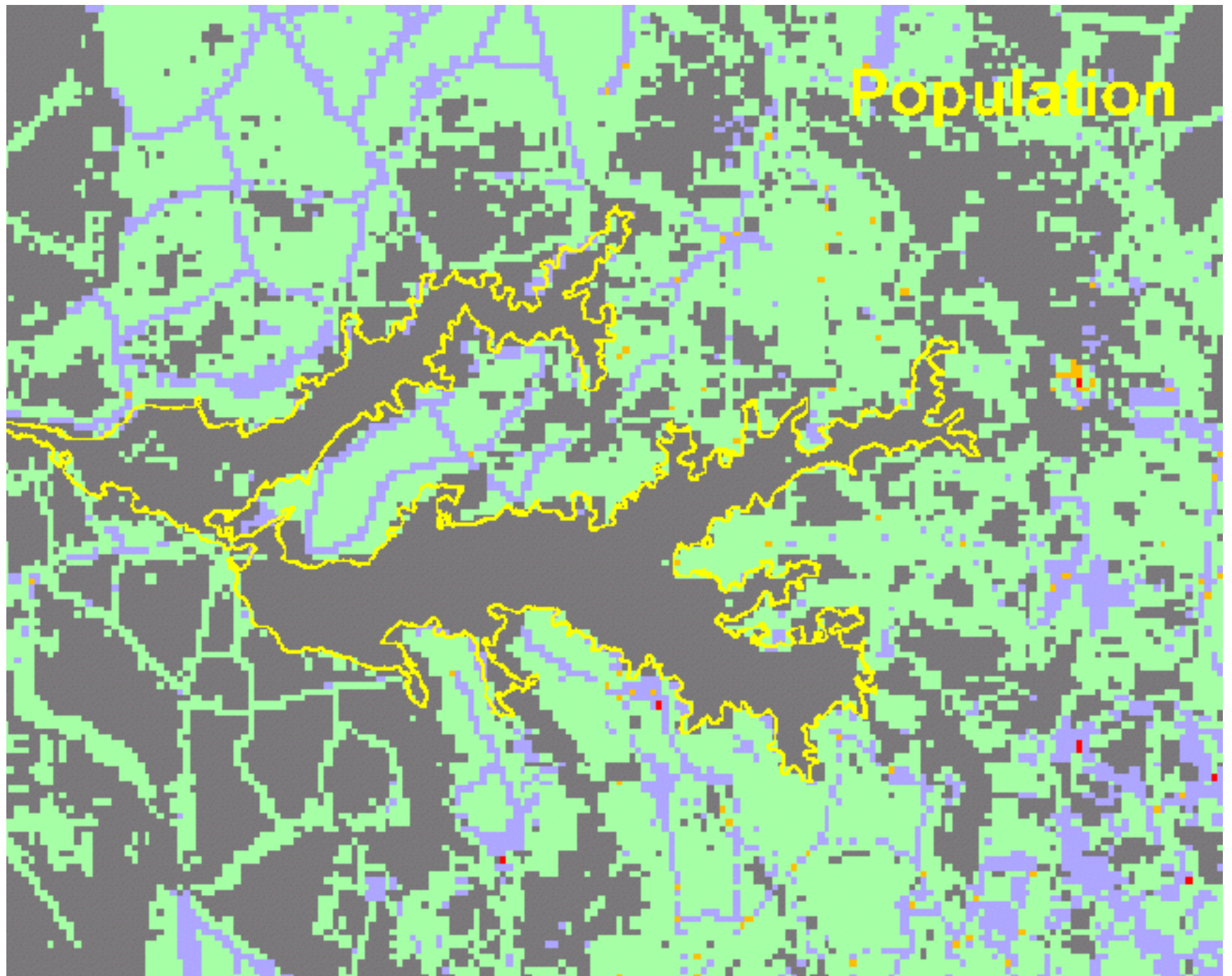


Relative waterlevel and lake+wetland area of Lake Kyoga, Uganda

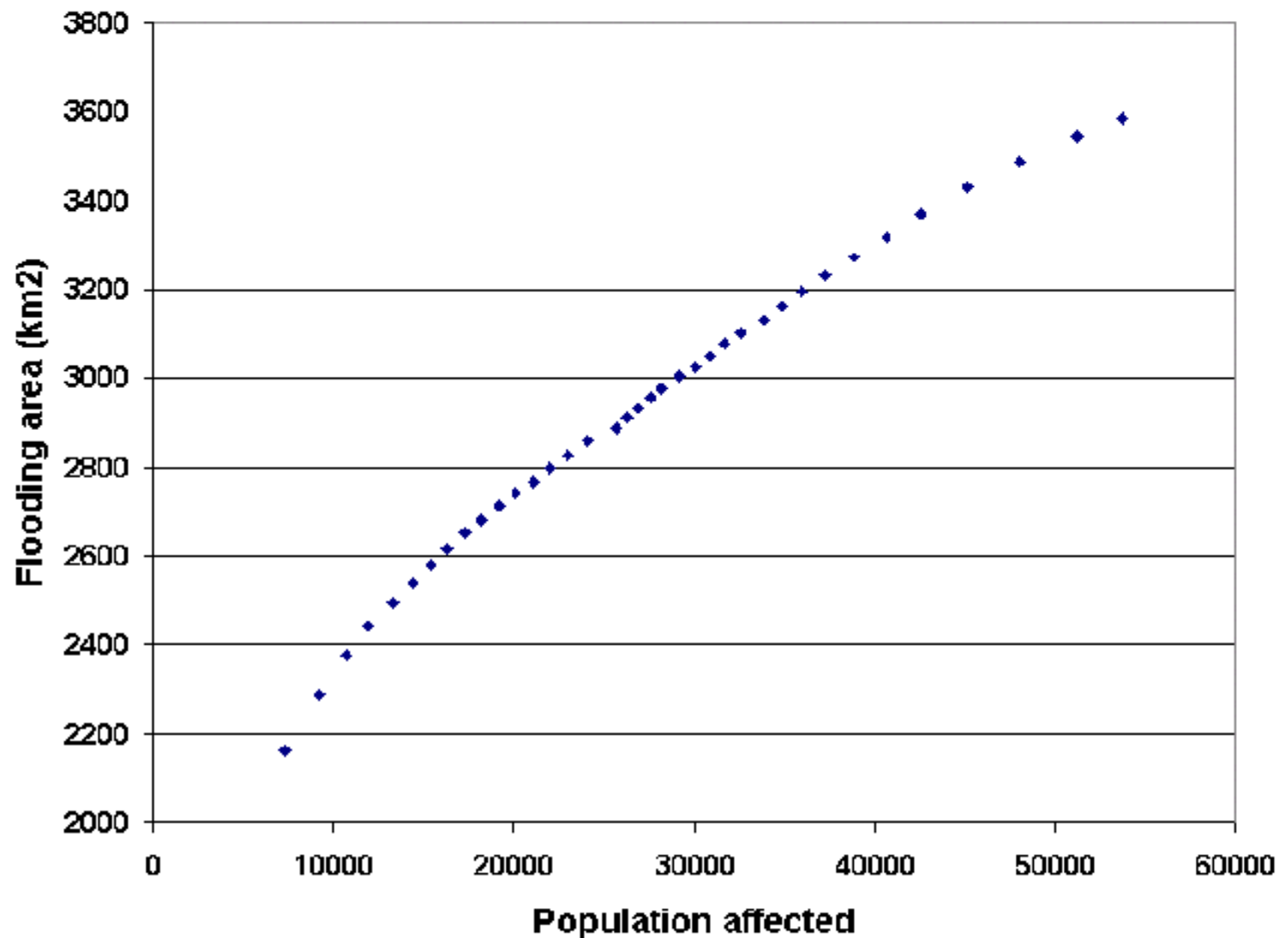




Population



Population affected by flooding in Lake Kyoga, Uganda



The water resources of Lake Kyoga have multiple uses



Fish yield statistics for Uganda 1952-2000

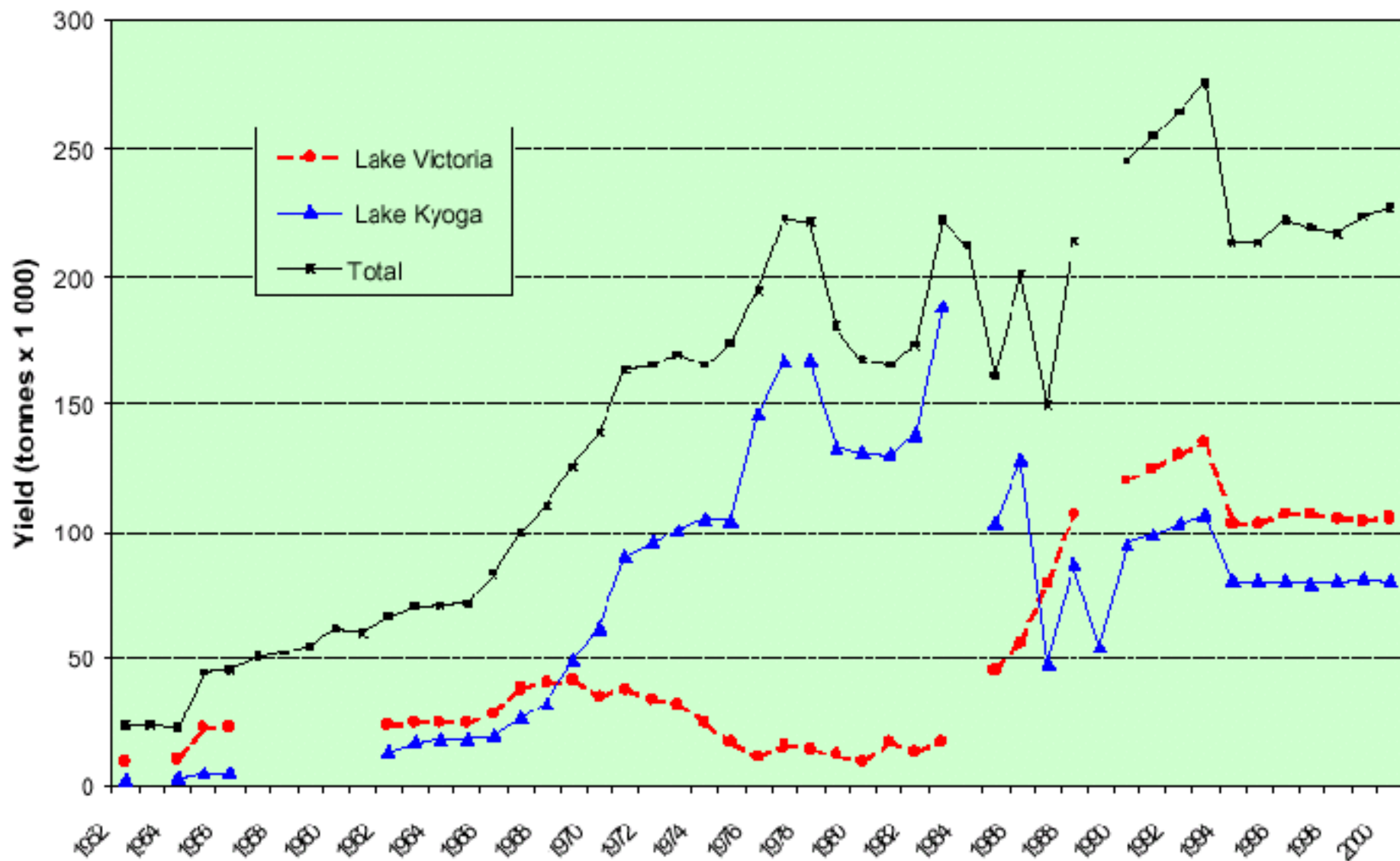


Figure 1 Fish yield statistics for Lakes Victoria (Ugandan portion) and Kyoga

Lake Kyoga produces around 40 % of the total fish catch of Uganda

- Nile Perch (29 %)
- Nile Tilapia (63 %)
- Lungfish (5 %)
- Mukene (unaccounted)



Mukene is important for the poor, as it can be bought in small quantities and have a long shelf life.

Average fish consumption is 10 kg per year, equal to 50 % of the total annual animal protein intake in Uganda.



The number of people involved in fishing in Lake Kyoga is around

- 50 000 Artisan fishermen (exclusively men)**





Around 200 000 persons involved in processing and trading the fish (mostly women), and boat and gear building and maintenance etc

The official Ugandan policy on fishing is
“Sustainable exploitation of the fishery
resources at the highest possible
level” (380 000 tonnes per annum)

Fishing is essentially open to all and
unregulated, hence

- **Illegal methods and net sizes are common**
- **Overfishing is most probably occurring**
- **There is (almost) no taxation on fishing**

And even if the Kyoga region is the most poverty ridden in Uganda, fishingfolks are in general

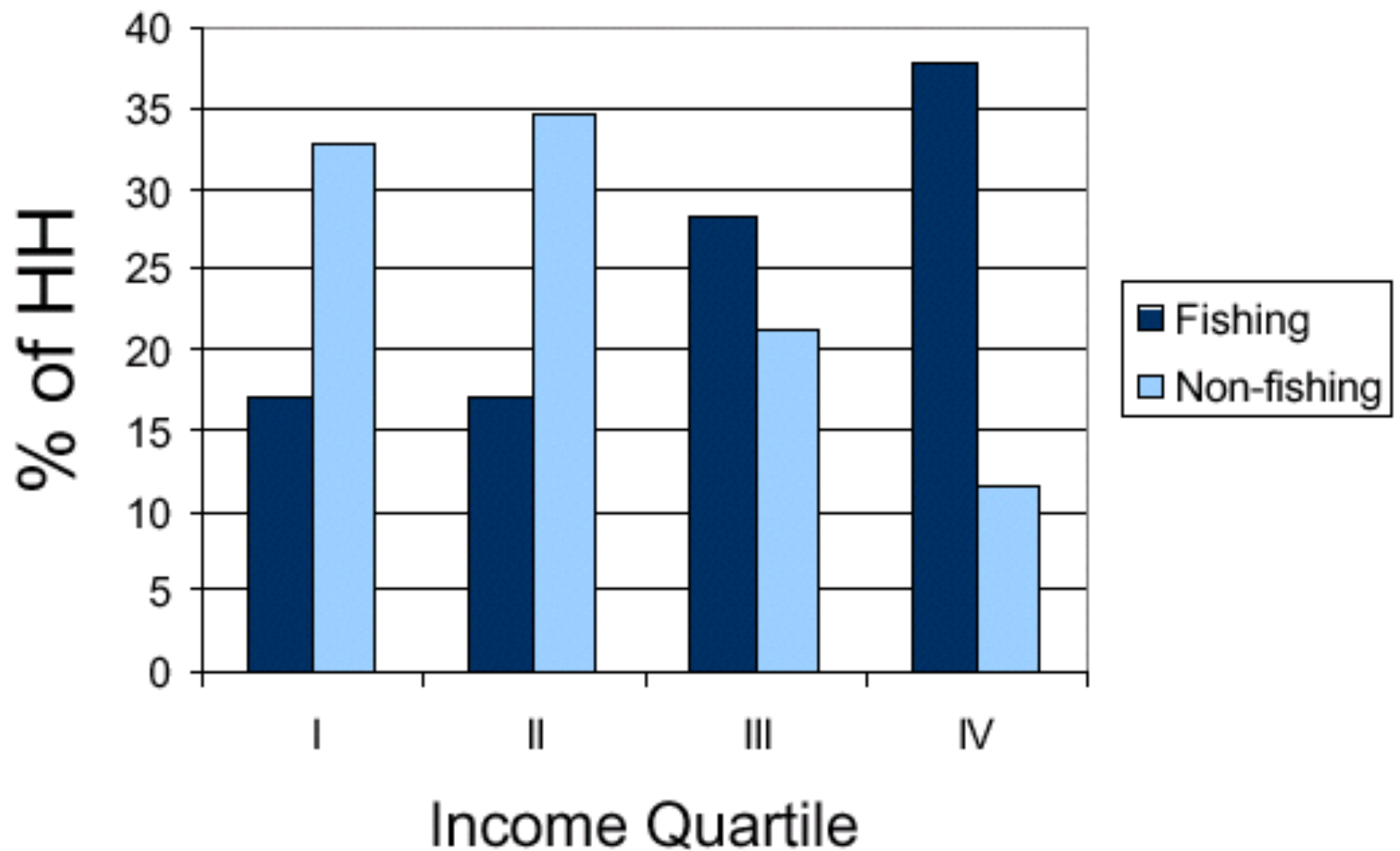
- Better educated**
- More wealthy**
- More prone to get HIV infected**



Income among fisherfolks and others

		Per capita income quartile				All
		I	II	III	IV	
Kamuli fishing	<i>N</i>	9	9	15	20	53
	Mean	90,760	186,540	389,832	2,079,394	942,095
	<i>s.d</i>	27,744	36,390	85,159	2,960,682	2,003,698
	Median	95,439	174,500	402,486	1,011,479	422,989
Kamuli non-fishing	<i>N</i>	17	18	11	6	52
	Mean	73,309	175,435	398,276	1,368,539	326,853
	<i>s.d</i>	35,493	36,013	81,843	961,361	501,030
	Median	72,706	169,224	408,000	960,394	169,224
All Kamuli	<i>N</i>	26	27	26	26	105
	Mean	79,350	179,137	393,404	1,915,350	637,404
	<i>s.d</i>	33,529	35,831	82,211	2,634,391	1,491,991
	Median	85,047	174,500	405,243	960,394	250,435

Income among fisherfolks and others



After the 1997/98 El Nino new settlers were attracted to the Lake, even forming a handful of communities living on the floating mats of papyrus (sudds) formed.



A group of people, mostly men and women, are standing on a platform made of reeds or bamboo, which appears to be a floating village. They are dressed in casual clothing, including t-shirts, shorts, and skirts. One man in the center is wearing a yellow life vest. The background shows a body of water and some distant land. The text is overlaid in a bold, orange font.

The people in the floating villages survive mainly by subsistence fishing, but also sell fish commercially.

The fishermen say that lungfish has increased in importance since the 1997/98 El Nino. The fishing statistics is too poor to support this statement

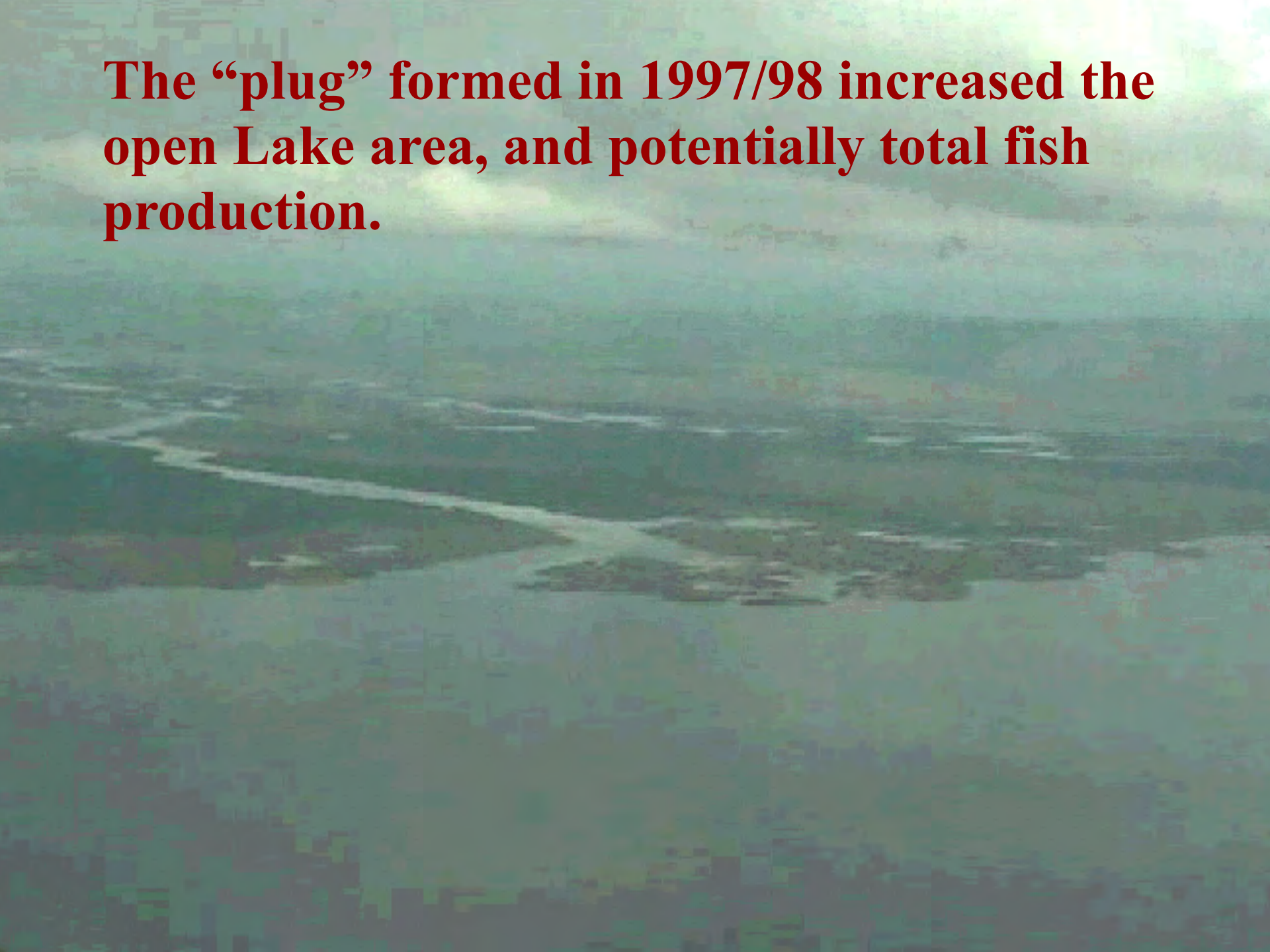


The decline in catches since the 1980s is thought to depend on

- Water hyacinth encroachment**
- Overfishing**
- Changes in species composition**
- Decrease in riparian wetland areas**
- Statistical methods used**



The “plug” formed in 1997/98 increased the open Lake area, and potentially total fish production.



The dredging now taking place has brought down the Lake surface around half a metre.



But the effects of continued dredging on total fish yield and livelihood sustenance on the fisherfolks is unknown.

