

BASIN AND SUB-BASIN DELINEATION IN THE NILE BASIN

Nile basin and sub-basin delineation by digital elevation models



About this poster

Basin area estimates have changed over time as digital elevation models and satellite imagery have improved. In fact several Nile Basin delineations exist, which include 1) Hydro 1k (orange line), 2) FAO Nile 1998 (blue line), and 3) FAO Nile 2007 (purple line), as presented in Figure 1.

The FAO 2007 delineation was carried out on the basis of the SRTM Digital Elevation Model (DEM) and Landsat imagery. For locations where the water divide was unclear, the drainage direction was determined by 'manual interpretation', i.e. checking the direction of the closest water courses using Landsat ETM+ Mosaics or Landsat TM images made available by the Global Land Cover Facility (<http://glcftp.umiaccs.umd.edu:8080/esdi/index.jsp>).

A large number of small corrections were made relative to the previous delineations. Two 'controversial' areas stand out: 1) Wadi Howar in northern Sudan, and 2) Lotikipi plain in north-east Kenya. Both areas are very flat and a difference of 1-2 meters in the SRTM DEM can make a relatively large change in basin delineation. It was concluded that Wadi Howar no longer contributed to the Nile Basin due to sand dunes that have blocked the original wadi, transferring Wadi Howar into a dormant or fossil sub basin.

By contrast, the Lotikipi Plain (30,769 km²) in north-east Kenya is most likely contributing to the Nile flows in very wet years, and thus technically belongs to the Nile. As a result of the evolution of digital mapping, the poster shows the principal sub basins adopted for FAO Nile project. The definition of sub-basins for which the balance has been carried out has been derived on the basis of Hydroshed (<http://hydrosheds.cr.usgs.gov>) 15 second data and comprises the 11 principal sub-basins listed in Table 1. This group of sub-basins is used subsequently to run a basin water balance.

Figure 1: Different Nile basin delineations

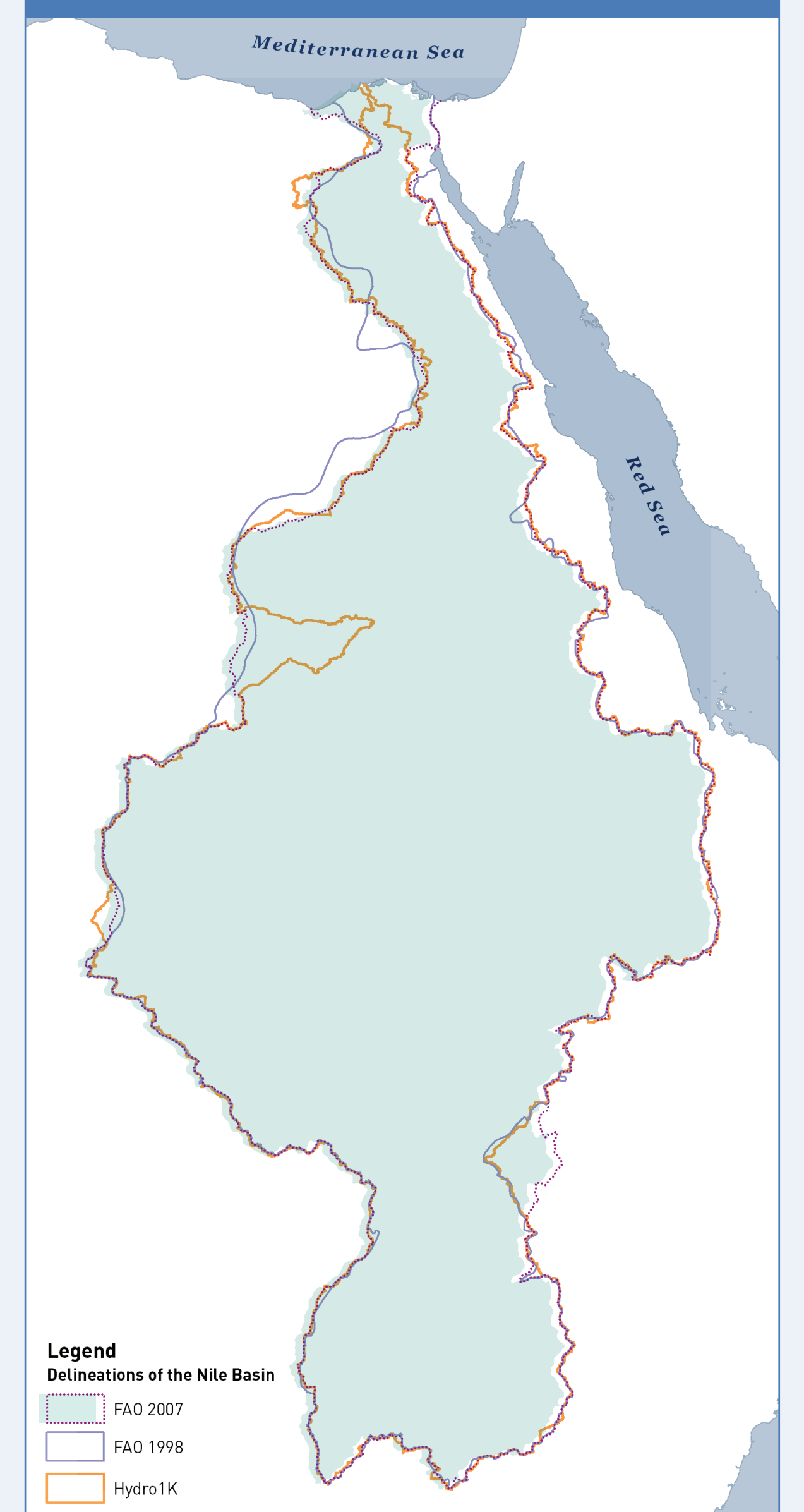


Table 1: Principle Nile sub-basin areas

NBI Grouping	Countries	Sub-basin	Area (km ²)	
Equatorial Lakes	Burundi Kenya Rwanda Tanzania Uganda	Lake Victoria	264 985	
	DR Congo Uganda	Lake Kyoga - lake Albert - Aswa	197 253	
	Sudan	Bahr el Jebel - Sudd	136 400	
	Sudan	Bahr el Ghazal	236 330	
	Sudan	Bahr el Arab	370 098	
	Eastern Nile	Kenya Ethiopia Sudan	Sobat	247 779
		Sudan	White Nile	220 943
Ethiopia		Blue Nile	308 198	
Ethiopia		Atbara	237 044	
Sudan		Main Nile downstream of Khartoum confluence (to Atbara)	34 523	
Egypt Sudan	Main Nile downstream of Atbara confluence	877 866		
TOTAL			3 170 418	