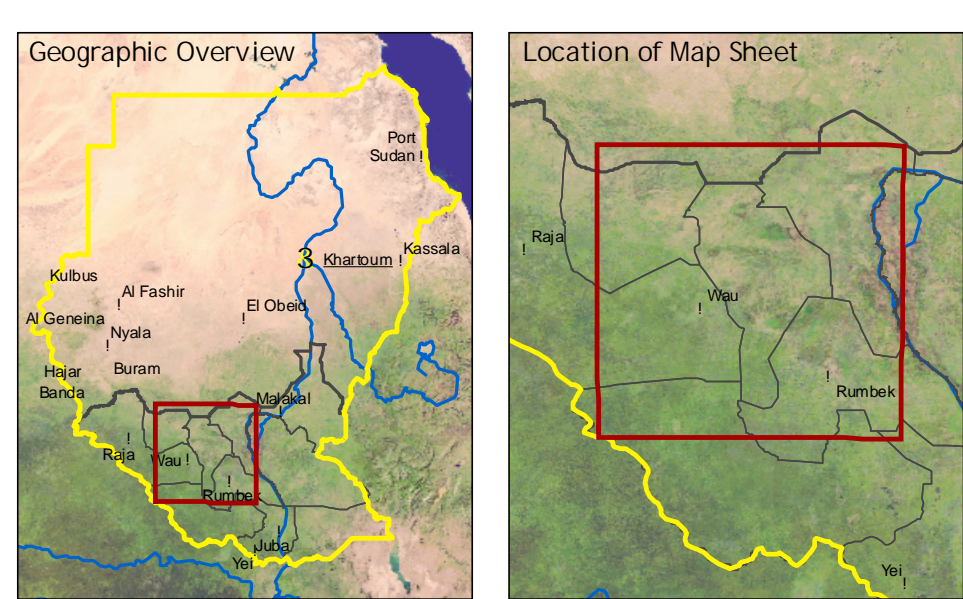


Southern Sudan State Map Series

Warrap State

Sudan
1 : 500'000

Federal Department
of Foreign Affairs
3003 Berne, Switzerland



- Political boundaries
- State boundary (tentative)
- National boundary
- North-South demarcation line 1956 (tentative)
- Topography
- Spot height
- Main contour (100m interval)
- Intermediate contour (40m interval)
- Supplementary contour

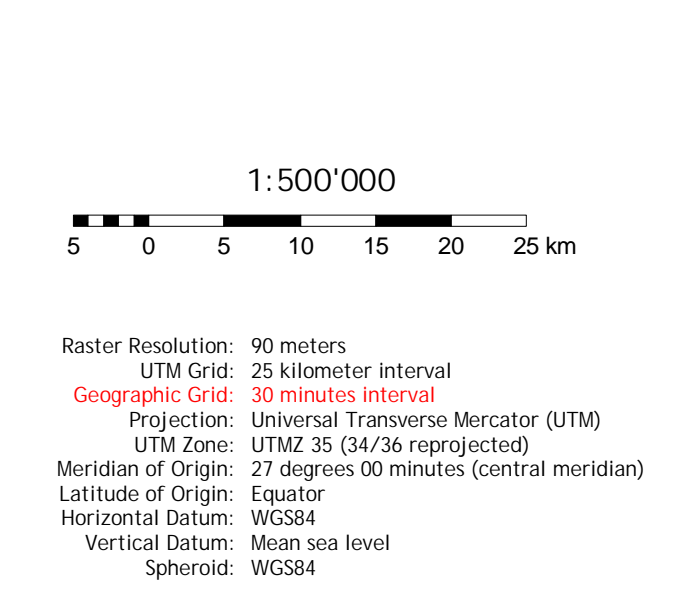
- Settlements
- State capital
- Principal town
- Secondary town
- Administrative town
- Settlement (verified)
- Settlement (not verified)
- Built-up area
- Geographical features
- Hills and mountains

- Infrastructure features
- Airstrip (CDE)
- Main road (CDE)
- Gravel road (CDE)
- Dirt road (CDE)
- Street (CDE)
- Railway (CDE)
- Non-operational
- Bridge (EIS)
- Main road (EIS)
- Gravel road (EIS)
- Street (EIS)
- Dirt road and track (EIS)

- Hydrological features
- Canal (unfinished)
- Pipeline
- Main river
- Seasonal river
- Occasional river
- Erosion river
- Dry river
- Canal
- Lake and riverbed

- Elevation classes
- below 400 m
- 401 - 450 m
- 451 - 500 m
- 501 - 550 m
- 551 - 700 m
- 701 - 900 m
- 901 - 1300 m
- 1301 - 1800 m
- 1801 - 2500 m
- above 2500 m

- Land cover classes
- Forest
- Bushland
- Sparse vegetation
- Arable land
- Surface water
- Wetlands
- Freshwater marshes and floodplains
- Brackish and saline wetland



Project Information
The present map sheet is composed of field maps (1:250,000) and is one of the maps of the Southern Sudan State Map Series (1:500,000). The maps and the geodatabase were prepared by the Centre for Development and Environment (CDE) of the University of Berne, Switzerland, with funding from the Swiss Federal Department of Foreign Affairs. The map is being released as a technical contribution to support the humanitarian, peace-keeping and reconstruction efforts in Southern Sudan. Boundaries, transportation, settlement locations and the North-South demarcation line of 1956 drawn on this map are not authoritative and should not be considered as such. The CDE, University of Berne would well welcome any information that could improve this map. For comments and suggestions, please contact the CDE at info@cdere.ch.

Data sources
Most of the line and point features were provided by Earthview Information Services, Minneapolis, USA (EIS) based on the Russian Military Topographic Map, 1:200,000 and 1:100,000 Series. Many recent objects (mainly infrastructure, such as roads, pipelines, air strips, as well as resettled villages, water surfaces and meadows) were added, based on satellite image interpretation by CDE.

Data compilation
Georeferencing of spatial data was obtained through vector-to-raster rectification. Except for the non-stopping area, NASA's SRTM data were used as a reference for topographic features and for the development of a digital terrain model (DTM). The DTM has a 90-meter resolution and shows contours. Artificial hills and shaded relief in flat areas of the DTM was calculated based on spot heights and contours from map sources. Ground truthing and control points were not applied. Automatic geometric distortion is estimated to be below 7-150 m. Wetlands, forest, bush and shrub cover were derived from Landsat ETM+, Terra MODIS (VI) and AVHRR and FAO AICover data (agriculture). Information was classified and cross-validated. Verification on terrain was not applied. Vector modelling, geodata compilation and digital cartography were done with ESRI ArcGIS 9.1 and LISA ERMG (WGS84, UTM).

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