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SOUTHERN SUDAN

Topographic Base Map Series

Map Sheet: C **Jonglei**

1:500'000

0 10 20 30 40 50 km

Raster Resolution: 90 meters
UTM Grid: 25 kilometer interval
Geographic Grid: 30 minutes interval
Projection: Universal Transverse Mercator (UTM)
UTM Zone: UTM2 35
Meridian of Origin: 27 degrees 00 minutes E of Greenwich
Latitude of Origin: Equator
Horizontal Datum: WGS84
Vertical Datum: Mean sea level
Spheroid: WGS84

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Version: Release 2.2, October 2008
Internet: www.cde.unibe.ch

Settlements
- State capital
- Principal town
- Secondary town
- Administrative town
- Settlement (verified)
- Settlement (not verified)
- Built - up area
- Vulnerable area (camp, idp)
- School

Infrastructural features
- Airstrip
- Main road
- Gravel road
- Track / path (dry weather)
- Street
- Railway (not operational)
- Bridge
- River crossing

Topography
- Spot height
- Main contour (100m interval)
- Intermediate contour (50m interval)
- Supplementary contours (25m interval)

Elevation classes
- < 400 m
- 401 - 450 m
- 451 - 500 m
- 501 - 550 m
- 551 - 700 m
- 701 - 900 m
- 901 - 1,300 m
- 1,301 - 1,800 m
- 1,801 - 2,500 m
- > 2,500 m

Political boundaries (not authoritative)
- National boundary
- State boundary (tentative)

Geographical features
- Hills and mountains
- Dunes

Tribal area
- Dinka Nomadic or tribal area

Hydrological features
- Main river
- Seasonal river
- Occasional river
- Episodic river
- Dry river
- Canal
- Canal (unfinished)
- Pipeline
- Borehole (machine / hand drilled)
- Culvert
- Pond / pool
- Reservoir
- Spring
- Waterhole
- Well
- Wetland

Land cover classes
- Sparse vegetation (single shrubs, grassland)
- Shrubby vegetation (scrubland)
- Dense vegetation (groves, mature crops)
- Agriculture (irrigated, rainfed)
- Settlement area (built-up area)
- Outcrop / no vegetation cover (basement, vulcanic)
- Wetlands (marshes, swamps)
- Surface water / wet season (perennial waterbodies)

Disclaimer

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Project information

The Southern Sudan Topographic Base Map Series (Release II) is part of a **Capacity Development Programme in Geoinformation Management** funded by the **Swiss Agency for Development and Cooperation (SDC)** to support the Government of Southern Sudan. The geospatial database covers the entire area of the States of Southern Sudan. The map series consists of five completely revised, updated and enhanced map sheets. The data base and geospatial models were developed and prepared by the CDE.

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Data sources

Most of the line and point features were added based on satellite image interpretation.

Satellite sensors used: Terra/ASTER v-nir data for 2002-2006, Landsat ETM+ 7/4/2, EarthSat NaturalVue data of 2005), and Digital Globe QuickBird 2 imagery (2003-2005).

Internet sources: GeoNetwork of SIN (Sudan Interagency Mapping) www.unsudanig.org, UNOCHA, UNICEF, UNJLC, UNHAS, UNMAS, WFP, Global Name and Gazetteer data.

Map sources: Eastview Information Services (EIS), Minneapolis, www.cartographic.com (mainly Russian Military Topographic Maps, 1:200k and 1:100k).

Data compilation

Georeferencing of spatial data was obtained through image-to-image and vector-to-image rectification. Except for the non-sloping area, NASA's Shuttle Radar Topography Mission (SRTM) data were used as the principal reference for topographic features and the development of the digital terrain and drainage model. The DTM has a 90-meter resolution and shows contours (50 m intervals), slopes, aspects, spot heights and shaded relief. In flat areas the DTM was calculated based on spot heights and contours from map sources. Ground control points were not applied. Average geometric distortion is estimated to be below +/- 100 m. Wetlands, forest, bush/shrub and agricultural areas were derived from Landsat ETM+, Terra MODIS (NCF, EVI), and FAO AfriCover data (agriculture). The land cover model was cross-validated. In situ verification of data was not applied. Raster modelling, geodata compilation, and digital cartography were done with ESRI ArcGIS 9.2 and Leica ERDAS IMAGINE 9.2. Minor settlement, tracks and foot path features were extracted based on high resolution imagery (only partial coverage).

Data Modelling

The latest earth-orbiting spacecrafts such as TerraASTER, SPOT-5 and NASA's space shuttle (SRTM mission 2000) were the main sources for map update, and terrain and drainage modelling. Geographic information technology (GIS, GPS, and Earth Observation) was used to create a seamless and detailed geospatial database of Southern Sudan.

Image courtesy of SPOT Image S.A., France (SPOT-5 over Juba in 2003) and NASA HQ Washington, DC, USA (SRTM flight in 2000).