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|---|---|
| <b>Settlements</b><br><ul style="list-style-type: none"> <li>● State capital</li> <li>● Principal town</li> <li>● Secondary town</li> <li>● Administrative town</li> <li>● Settlement (verified)</li> <li>● Built-up area</li> <li>▲ Vulnerable area</li> <li>▲ School</li> </ul>   | <b>Political boundaries (not authoritative)</b><br><ul style="list-style-type: none"> <li>— National boundary</li> <li>— State boundary (tentative)</li> </ul>  |
| <b>Infrastructure features</b><br><ul style="list-style-type: none"> <li>— Main road</li> <li>— Gravel road</li> <li>— Track / path (dry weather)</li> <li>— Street</li> <li>— Railway (not operational)</li> <li>— Bridge</li> <li>— River crossing</li> </ul>   | <b>Geographical features</b><br><ul style="list-style-type: none"> <li>▲ Hills and mountains</li> <li>▲ Dunes</li> </ul>  |
| <b>Topography</b><br><ul style="list-style-type: none"> <li>● Spot height</li> <li>— Main contour (100m interval)</li> <li>— Intermediate contour (50m interval)</li> <li>— Contours (25m interval)</li> </ul>  | <b>Tribal area</b><br><ul style="list-style-type: none"> <li>— Dinka / Ndomic or tribal area</li> </ul>   |
| <b>Elevation classes</b><br><ul style="list-style-type: none"> <li>— &lt; 400 m</li> <li>— 401 - 450 m</li> <li>— 451 - 500 m</li> <li>— 501 - 550 m</li> <li>— 551 - 700 m</li> <li>— 701 - 900 m</li> <li>— 901 - 1,300 m</li> <li>— 1,301 - 1,800 m</li> <li>— 1,801 - 2,500 m</li> <li>— &gt; 2,500 m</li> </ul>  | <b>Hydrological features</b><br><ul style="list-style-type: none"> <li>— Main river</li> <li>— Seasonal river</li> <li>— Epissolic river</li> <li>— Dry river</li> <li>— Canal</li> <li>— Canal (unflooded)</li> <li>— Pipeline</li> <li>— Reservoir / hand drilled</li> <li>— Culvert</li> <li>— Pond / pool</li> <li>— Reservoir</li> <li>— Spring</li> <li>— Waterhole</li> <li>— Well</li> <li>— Wetland</li> </ul>   |
| <b>Land cover classes</b><br><ul style="list-style-type: none"> <li>— Sparse vegetation (single shrubs, grassland)</li> <li>— Shrubby vegetation (scrubland)</li> <li>— Dense vegetation (woodland, mature crops)</li> <li>— Agriculture (irrigated, rangeland)</li> <li>— Settlement area (built-up area)</li> <li>— Outcrop / no vegetation cover (settlement, volcanic)</li> <li>— Wetlands (marshes, swamps)</li> <li>— Surface water / wet season (perennial waterbodies)</li> </ul> | <b>Land cover classes</b><br><ul style="list-style-type: none"> <li>— Sparse vegetation (single shrubs, grassland)</li> <li>— Shrubby vegetation (scrubland)</li> <li>— Dense vegetation (woodland, mature crops)</li> <li>— Agriculture (irrigated, rangeland)</li> <li>— Settlement area (built-up area)</li> <li>— Outcrop / no vegetation cover (settlement, volcanic)</li> <li>— Wetlands (marshes, swamps)</li> <li>— Surface water / wet season (perennial waterbodies)</li> </ul> |

**Disclaimer**  
 The boundaries (north/south, state and international), denominations, and any other information shown on this map do not imply any judgment about the legal status of any territory, or constitute any endorsement or acceptance of the boundaries or the part of any Government. The publisher, the Centre for Development and Environment (CDE), is not responsible for claims by any third party and assumes no liability for any direct, incidental, or consequential damages whatsoever.

**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 project also covers the entire area of the State 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 processed by the CDE.  
**Map authors:** Christoph Hoeh, Jung Krauer, Christian Heugarten, Ursula Gampert, Silvia Kautler-Bath, Simonetta Cavazzana, Geoprocessing Unit, CDE, University of Bern.  
 Please note that when information is used in other mapping products, the source of the map must be credited or cited: CDE, University of Bern, Southern Sudan Topographic Base Map Series (map) 1:500,000, Release 2.2, October 2008, Bern, CDE, 2008.

**Data sources**  
 Most of the line and point features were added based on satellite image interpretation. Satellite sensors used: Terra ASTER (for data for 2002-2006, Landsat ETM+ 7/4/2, Earthstar (for data of 2000), and Digital Globe QuickBird 2 imagery (2003-2005).  
**Internet sources:** Geonetwork of SM (Swiss Interagency Mapping) [www.unil.ch/igis](http://www.unil.ch/igis), UNOSAT, UNICEF, INSIDE, UNHCR, UNWIS, WFP Global Names and Geospatial Data.  
**Map sources:** Eastview Information Services (EIS), Minneapolis, [www.cadographic.com](http://www.cadographic.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 terrain and drainage model. The SRTM has a 30-meter resolution and shows contours (50 m intervals), slopes, aspects, spot heights and shaded relief. In the areas where SRTM data were not available, spot heights and contours from map sources. Ground control points were not applied. Average geometric distortion is estimated to be below ± 0.05m. Wetlands, forest, bush/shrub, and agricultural areas were derived from Landsat ETM+, Terra MODIS (VCF, EVI), and FAO Africover data (agri-cultures). The land cover model was cross-validated. In this rectification of data was not applied. Raster modelling, geospatial compilation, and digital cartography were done with ESRI ArcGIS 9.2 and Level ESRI MAGIC 9.2. Minor settlements, tracks and road features were extracted based on high resolution imagery (only partial coverage).

**Data Modelling**  
 The latest earth orbiting spacecrafts such as Terra ASTER, SPOT-5 and NASA's space shuttle (SRTM mission 2000) were the main sources for map updates, and terrain and drainage modeling. Geospatial 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).