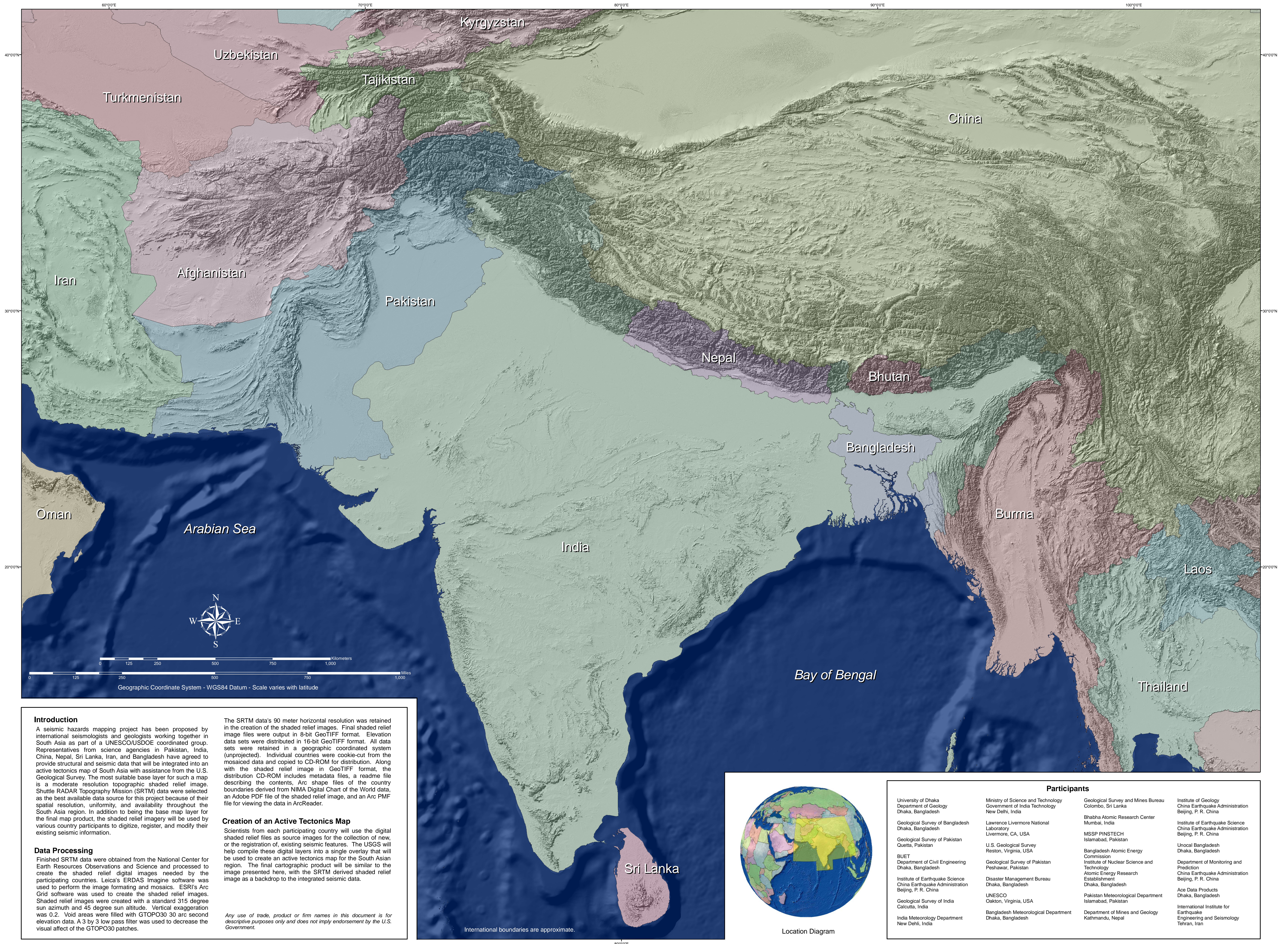


Use of Shuttle RADAR Topography Mission Data to Produce an Active Tectonics Map for South Asia

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Introduction
 A seismic hazards mapping project has been proposed by international seismologists and geologists working together in South Asia as part of a UNESCO/USDOE coordinated group. Representatives from science agencies in Pakistan, India, China, Nepal, Sri Lanka, Iran, and Bangladesh have agreed to provide structural and seismic data that will be integrated into an active tectonics map of South Asia with assistance from the U.S. Geological Survey. The most suitable base layer for such a map is a moderate resolution topographic shaded relief image. Shuttle RADAR Topography Mission (SRTM) data were selected as the best available data source for this project because of their spatial resolution, uniformity, and availability throughout the South Asia region. In addition to being the base map layer for the final map product, the shaded relief imagery will be used by various country participants to digitize, register, and modify their existing seismic information.

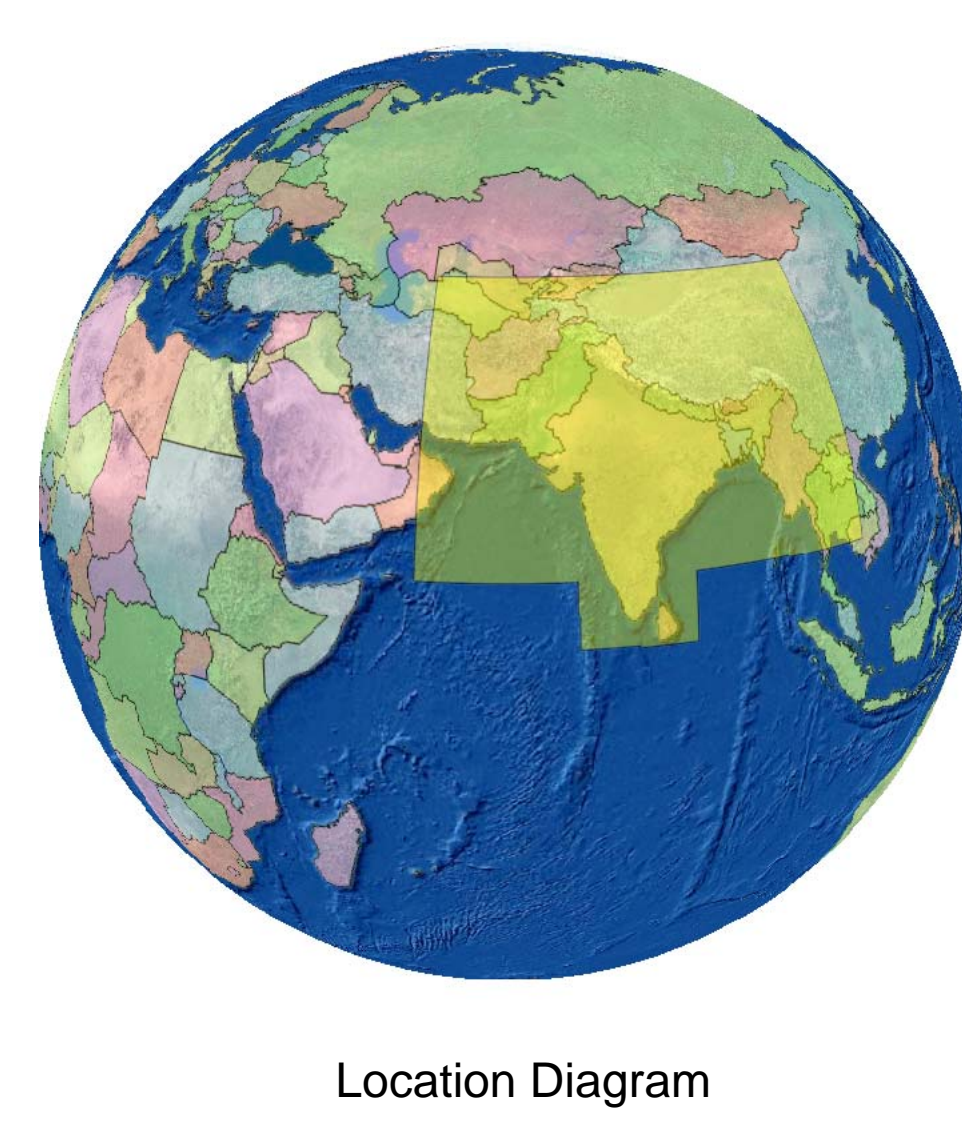
The SRTM data's 90 meter horizontal resolution was retained in the creation of the shaded relief images. Final shaded relief image files were output in 8-bit GeoTIFF format. Elevation data sets were distributed in 16-bit GeoTIFF format. All data sets were retained in a geographic coordinated system (unprojected). Individual countries were cookie-cut from the mosaiced data and copied to CD-ROM for distribution. Along with the shaded relief image in GeoTIFF format, the distribution CD-ROM includes metadata files, a readme file describing the contents, Arc shape files of the country boundaries derived from NIMA Digital Chart of the World data, an Adobe PDF file of the shaded relief image, and an Arc PMF file for viewing the data in ArcReader.

Creation of an Active Tectonics Map
 Scientists from each participating country will use the digital shaded relief files as source images for the collection of new, or the registration of, existing seismic features. The USGS will help compile these digital layers into a single overlay that will be used to create an active tectonics map for the South Asian region. The final cartographic product will be similar to the image presented here, with the SRTM derived shaded relief image as a backdrop to the integrated seismic data.

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Data Processing
 Finished SRTM data were obtained from the National Center for Earth Resources Observations and Science and processed to create the shaded relief digital images needed by the participating countries. Leica's ERDAS Imagine software was used to perform the image formatting and mosaics. ESRI's Arc Grid software was used to create the shaded relief images. Shaded relief images were created with a standard 315 degree sun azimuth and 45 degree sun altitude. Vertical exaggeration was 0.2. Void areas were filled with GTOPO30 30 arc second elevation data. A 3 by 3 low pass filter was used to decrease the visual affect of the GTOPO30 patches.

International boundaries are approximate.



Participants

University of Dhaka Department of Geology Dhaka, Bangladesh	Ministry of Science and Technology Government of India Technology New Delhi, India	Geological Survey and Mines Bureau Colombo, Sri Lanka	Institute of Geology China Earthquake Administration Beijing, P. R. China
Geological Survey of Bangladesh Dhaka, Bangladesh	Lawrence Livermore National Laboratory Livermore, CA, USA	Bhabha Atomic Research Center Mumbai, India	Institute of Earthquake Science China Earthquake Administration Beijing, P. R. China
Geological Survey of Pakistan Quetta, Pakistan	U.S. Geological Survey Reston, Virginia, USA	MSP/ PINSTECH Islamabad, Pakistan	Unocal Bangladesh Dhaka, Bangladesh
BUET Department of Civil Engineering Dhaka, Bangladesh	Geological Survey of Pakistan Peshawar, Pakistan	Bangladesh Atomic Energy Commission	Department of Monitoring and Prediction China Earthquake Administration Beijing, P. R. China
Institute of Earthquake Science China Earthquake Administration Beijing, P. R. China	Disaster Management Bureau Dhaka, Bangladesh	Institute of Nuclear Science and Technology Atomic Energy Research Establishment Dhaka, Bangladesh	Ace Data Products Dhaka, Bangladesh
Geological Survey of India Calcutta, India	UNESCO Oakton, Virginia, USA	Pakistan Meteorological Department Islamabad, Pakistan	International Institute for Earthquake Engineering and Seismology Tehran, Iran
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