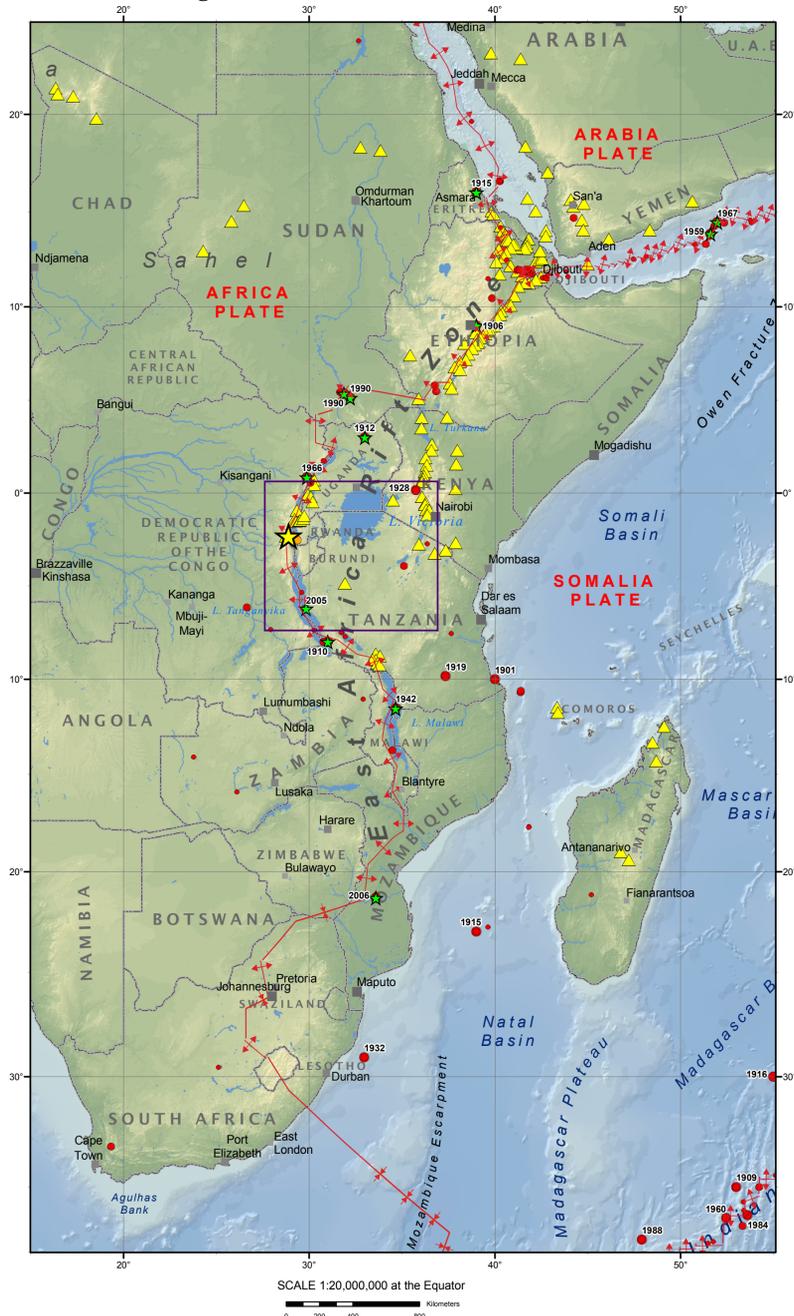


M5.9 Lac Kivu, Democratic Republic of Congo, Earthquake of 3 February 2008

Prepared in cooperation with the Global Seismographic Network



Tectonic Setting



Tectonic Summary

The earthquake occurred in the Western Rift of the East African rift system. The East African rift system is a diffuse, approximately 3000-km-long, zone of crustal extension that passes through eastern Africa from Djibouti and Eritrea on the north to Malawi on the south and that constitutes the boundary between the Africa plate on the west and the Somalia plate on the east. At the earthquake's latitude, the Africa and Somalia plates are spreading apart at a rate of about four millimeters per year. The earthquake occurred near Lake Kivu, the basin of which was created by normal faulting similar to that which produced the February 3 earthquake. The largest earthquake to have occurred in the rift system since 1900 had a magnitude of about 7.6. The epicenter of the February 3, 2008, earthquake is within several tens of kilometers of the epicenter of a magnitude 6.2 earthquake that killed two people in Goma in October 2002. Earthquakes within the East African rift system occur as the result of both normal faulting and strike-slip faulting.

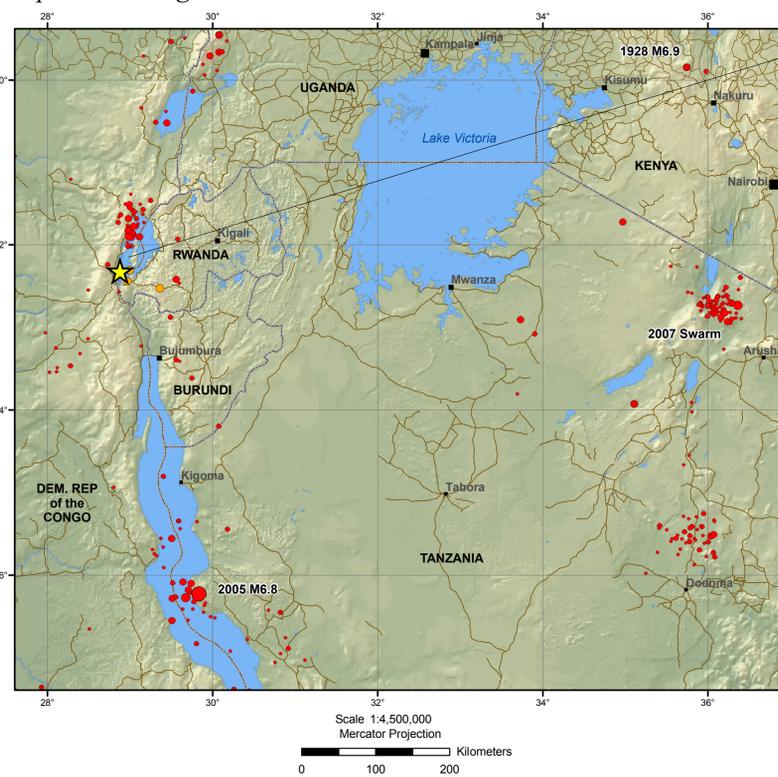
EXPLANATION

- ★ Main Shock
 - Aftershocks
 - ★ Large Rift events
- Earthquake Magnitude**
- < 5
 - 5 - 5.4
 - 5.5 - 5.9
 - 6 - 6.4
 - 6.5 - 6.9
 - > 7
- Plate Boundary Type**
- Subduction
 - Transform
 - Divergent
 - Convergent
 - ▲ Volcanoes

Significant Earthquakes Mag >= 6.8

Year	Mon	Day	Time	Lat	Long	Dep	Mag
1901	03	16	11:56	-10.000	40.000	0	6.9
1906	08	25	13:47	9.000	39.000	0	6.8
1909	04	29	22:41	-35.000	53.000	0	6.8
1910	12	13	11:37	-8.000	31.000	0	7.6
1912	07	09	08:18	3.000	33.000	0	6.8
1915	05	08	13:42	-23.000	39.000	0	6.8
1915	09	23	08:14	16.000	29.873	15	7.2
1916	04	07	09:26	-30.000	55.000	0	7.2
1919	07	08	21:05	-9.834	37.343	15	6.8
1928	01	06	19:31	0.155	35.748	15	6.9
1932	12	21	06:30	-29.084	32.957	15	6.8
1942	10	09	15:46	-11.538	34.646	25	6.8
1959	12	21	11:19	13.847	51.616	35	6.8
1960	11	22	06:21	-36.362	52.463	35	6.8
1966	03	20	01:42	0.842	29.873	15	7.2
1967	11	23	08:35	14.449	51.983	13.2	7.0
1984	05	17	16:53	-36.240	53.602	17.5	6.9
1988	02	26	06:17	-37.293	47.920	9	6.8
1990	05	20	02:22	5.126	32.197	15	7.1
1990	05	24	20:00	5.355	31.868	16	7.1
2005	12	05	12:19	-6.224	29.830	22	6.8
2006	02	22	22:19	-21.324	33.583	11	7.5

Epicentral Region



Lac Kivu, DRC
03 February 2008 7:34:12 UTC
2.317° S., 28.879° E.
Depth 10 km
Mw = 5.9 (USGS)

Five people killed at Bukavu, Congo (symbol obscured by earthquake symbol). Ten people killed in western Rwanda and thirteen killed in Nyamasheshe district. Over three hundred injured across the region.

Predicted Shaking

USGS science for a changing world

USAID FROM THE AMERICAN PEOPLE

M 5.9, LAC KIVU REGION, DEM. REP. OF THE CONGO PAGER
Version 4
Origin Time: Sun 2008-02-03 07:34:12 UTC
Location: 2.32°S 28.88°E Depth: 10 km
Created: 1 days, 8 hrs after earthquake

Estimated Population Exposed to Earthquake Shaking

ESTIMATED POPULATION EXPOSURE (k = x1000)	0	100k	200k	300k	400k	500k	600k	700k	800k	900k	1000k
ESTIMATED MODIFIED MERCALLI INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+		
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Vary strong	Severe	Violent	Extreme		
POTENTIAL DAMAGE	Resistant Structures	none	none	none	V. Light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy
	Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy	V. Heavy

Population Exposure



Selected City Exposure

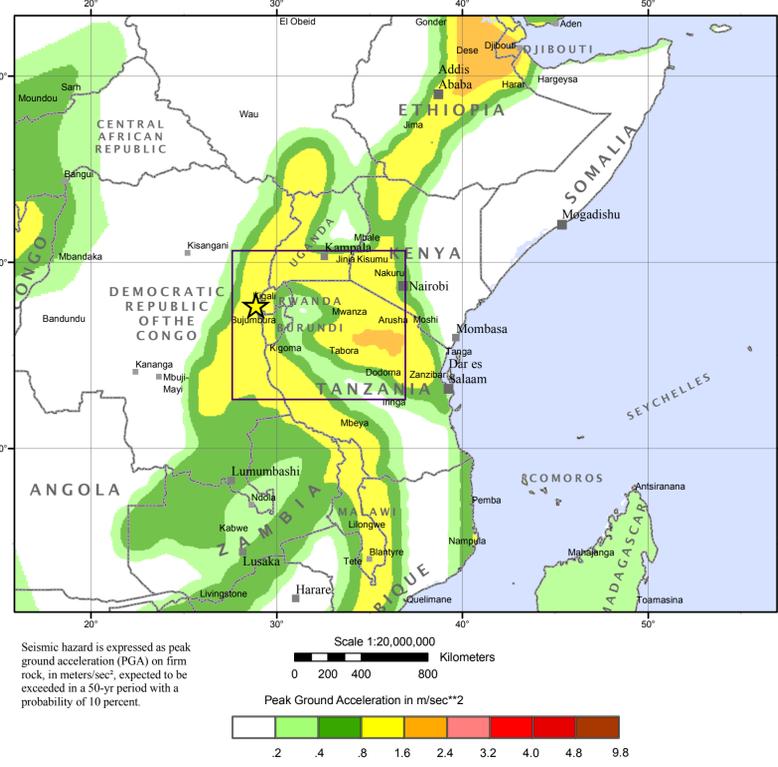
NMI City	Population
VI Kabare	37k
VI Cyangugu	63k
VI Bukavu	225k
V Kibuye	48k
V Gisenyi	83k
V Goma	144k
IV Giarama	87k
IV Uvira	170k
IV Butare	89k
IV Bujumbura	331k
IV Kigali	745k

Shaking Intensity MMI

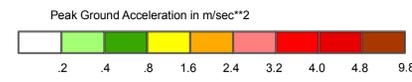
Users should consider the preliminary nature of this information and check for updates as additional data becomes available. Population exposure estimates are NOT a direct estimate of earthquake damage; comparable shaking will result in significantly lower losses in regions with well built structures than in regions with vulnerable structures. Overall, structures in this region are vulnerable to earthquake shaking, though some resistant structures exist. A magnitude 5.1 earthquake struck the Congo region in January, 2002, with estimated population exposures of 350,000 at intensity V and 680,000 at intensity IV, resulting in 45 deaths.

This information was automatically generated and has not been reviewed by a seismologist.
<http://earthquake.usgs.gov/pager> Event ID: us2008mzam

Seismic Hazard



Seismic hazard is expressed as peak ground acceleration (PGA) on firm rock, in meters/sec², expected to be exceeded in a 50-year period with a probability of 10 percent.



DISCLAIMER
Base map data, such as place names and political boundaries, are the best available but may not be current or may contain inaccuracies and therefore should not be regarded as having official significance.

DATA SOURCES
EARTHQUAKES AND SEISMIC HAZARD
USGS, National Earthquake Information Center
IASPEI, Centennial Catalog (1900 - 1999) and extensions (Engdahl and Villaseñor, 2002)
Global Seismic Hazard Assessment Program

PLATE TECTONICS AND FAULT MODEL
PB2002 (Bird, 2003)

BASE MAP
NIMA and ESRI, Digital Chart of the World
USGS, EROS Data Center
NOAA GEBCO and GLOBE Elevation Models

REFERENCES
Bird, P., 2003, An updated digital model of plate boundaries. *Geochem. Geophys. Geosyst.*, v. 4, no. 3, pp. 1027-80.
Engdahl, E.R. and Villaseñor, A., 2002, *Global Seismicity: 1900 - 1999*, chap. 41 of Lee, W.H.K., and others, eds., *International Earthquake and Engineering Seismology*, Part A, New York, N.Y., Elsevier Academic Press, 932 p.

Map prepared by U.S. Geological Survey
National Earthquake Information Center
2008
Not approved for release by Director USGS