

## Colombia Earthquake

By Tom Irvine



Figure 1. Residents stand outside a damaged building in Cali, Colombia (Photo courtesy of AP)

A magnitude 7.2 earthquake occurred in Colombia, on November 14, 2004, 4:06:55 am local time. The epicenter was in the Pacific Ocean off the coast of Colombia's Choco province.

The earthquake occurred near the boundary of the Nazca and South American plates. In this region, the Nazca plate is moving easterly with respect to the South American plate with a velocity of about 60 mm/year and subducting beneath it.

There were no fatalities, but several people were injured.

A number of homes were destroyed, particularly in the Buenaventura area. Colombian president Alvaro Uribe said that houses which had been seized by the government in anti-narcotic operations could be used by those who had been badly affected by the earthquake.

About 60 patients and staff from a small hospital in Cali were evacuated after the building was deemed unstable.

Magnitude 7.0 NEAR WEST COAST OF COLOMBIA  
Monday, November 15, 2004 at 09:06:55 UTC

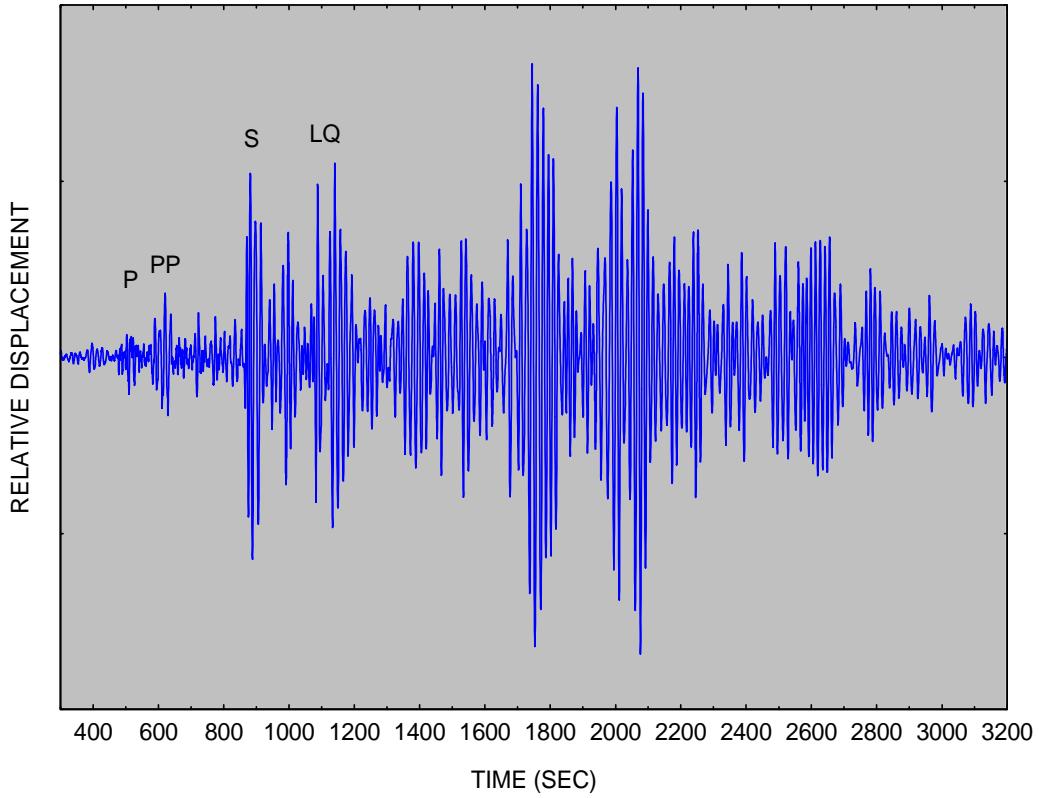


Figure 2.

The time history was recorded on my Lehman seismometer in Mesa, Arizona. The time scale is adjusted so that the earthquake occurs at time zero.

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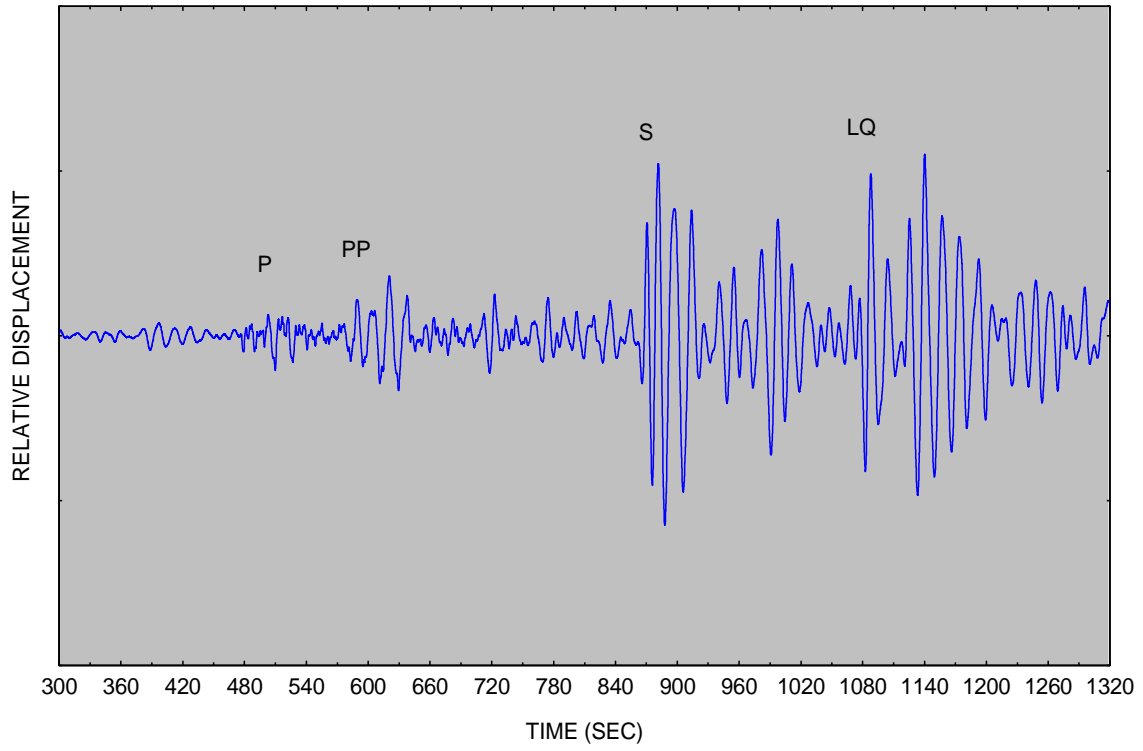


Figure 3.



**Magnitude** 7.2

**Date-Time** Monday, November 15, 2004 at 09:06:55 (UTC)

= Coordinated Universal Time

Monday, November 15, 2004 at 4:06:55 AM

= local time at epicenter

[Time of Earthquake in other Time Zones](#)

**Location** 4.632°N, 77.542°W

**Depth** 10 km (6.2 miles) set by location program

**Region** NEAR THE WEST COAST OF COLOMBIA

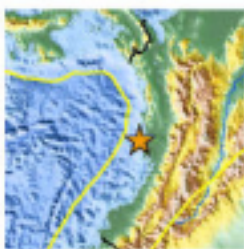
**Distances**

95 km (60 miles) NNW of **Buenaventura, Colombia**

155 km (95 miles) SW of **Quibdo, Colombia**

160 km (100 miles) WNW of **Tulua, Colombia**

385 km (240 miles) W of **BOGOTA, Colombia**



**Location** horizontal +/- 4 km (2.5 miles); depth fixed by

**Uncertainty** location program

**Parameters** Nst=210, Nph=210, Dmin=895.9 km, Rmss=0.71 sec, Gp= 65°,

M-type=moment magnitude (Mw), Version=8

**Source** USGS NEIC (WDCS-D)

**Event ID** usqw4t

DATE-(UTC)-TIME      LAT      LON      DEPTH MAG      Q      COMMENTS  
 2004/11/15 09:06:55    4.63N    77.54W    10.0 7.0      US:

NEAR WEST COAST OF COLOM

Expected 20s period surface wave amplitude  
 [ 1.96E+02  $\mu\text{m}$ ] [ 6.14E+01  $\mu\text{m/s}$ ]  
 Expected 1s period body wave amplitude  
 [ 3.16E+00  $\mu\text{m}$ ] [ 1.99E+01  $\mu\text{m/s}$ ]

delta      azimuth (degrees clockwise from north)  
 (deg)      eq-to-station      station-to-eq  
 42.89                  316.1                  124.3

#	code	travel	arrival time			
		time(s)	dy	hr	mn	sec
1	P	478.44	0	9	14	53
2	pP	481.56	0	9	14	56
3	sP	482.89	0	9	14	57
4	PP	578.05	0	9	16	33
5	PP	584.20	0	9	16	39
6	PcP	589.07	0	9	16	44
7	ScP	820.15	0	9	20	35
8	PcS	821.42	0	9	20	36
9	S	863.93	0	9	21	18
10	pS	867.70	0	9	21	22
11	sS	869.26	0	9	21	24
12	PKiKP	1013.03	0	9	23	48
13	pPKiKP	1016.47	0	9	23	51
14	sPKiKP	1017.73	0	9	23	52
15	SS	1056.74	0	9	24	31
16	SS	1064.47	0	9	24	39
17	SS	1067.08	0	9	24	42
18	SnSn	1072.03	0	9	24	47
19	ScS	1079.48	0	9	24	54
20	SKiKP	1224.99	0	9	27	19
21	PKKPdf	1890.53	0	9	38	25
22	SKKPdf	2102.47	0	9	41	57
23	PKKSdf	2103.72	0	9	41	58
24	SKKSdf	2315.55	0	9	45	30
25	P'P'df	2395.75	0	9	46	50
26	P'P'ab	2466.31	0	9	48	1
27	S'S'df	3248.76	0	10	1	3
28	LQ	1088.52	0	9	25	3
29	LR	1208.10	0	9	27	3