



CEDIM Forensic Disaster Analysis Group & CATDAT, CATnews & Earthquake-Report.com





<u>Greece Earthquake – Report #1</u>

23.11.2015 - Summary Report



Report Contributors:

James E. Daniell, Andreas M. Schaefer, Antonios Pomonis, Bernhard Mühr, Friedemann Wenzel

Official Disaster Name	Date	UTC	Local	CATDAT_ID
Lefkada Earthquake	17-Nov-2015	07:10:09.1	+2	2015-483

Preferred Hazard Information:

EQ_Latitude	EQ_Longitude	Magnitude	Hyp_Depth (km)	Fault Mech.	Source	Spectra
					BBNet,	
38.66	20.6	6.4 Mw	10	SS	Greece	Some avail.

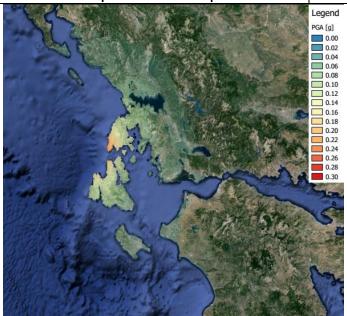
Duration: 50 secs

Location Information:

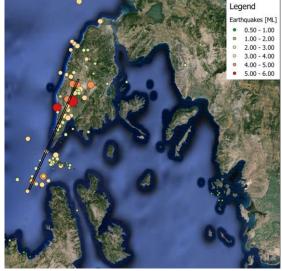
				Building PF (see			
				Karababa and			Population
Country	ISO	Dev. Region	Most Impact	Pomonis, 2011)	HDI (2015)	Cap Stock	(2015)
Greece	GR	Lefkas	Lefkas	0.82	0.832	Ca. \$2.1bn	Ca. 23000

Preferred Hazard Information:

MSK-64	MMI	PGA	Key Earthquake Hazard Metrics
VII	VII	Ca. 0.3g	Lefkada VII, Preveza, Vonitsa VI, Patras IV-V, Larisa IV, Thessaloniki
Earthquake Hazard Description		ription	III
1000 FREE LET AND THE SERVICE STATE OF THE SERVICE			



Around 0.3g has been recorded near the epicentre with 0.14g measured in other locations. Using PGA modelling, the most damage can be expected on Lefkada, Ithaki and Kefalonia to a lesser extent.



Earthquakes and aftershocks from the last 24 hours indicating the possible fault mechanism direction (fault length not indicated)

The fault projection extends through the centre of Lefkada according to aftershock activity.

Vulnerability and Exposure Metrics (Population, Infrastructure, Economic)



Left: Building typologies (Karababa and Pomonis, 2011) and Right: Population Density

Many studies have been previously done of Lefkada Island following the 2003 event which was centered around the north of the island. Most of the buildings on the island consist of load-bearing stone masonry, and reinforced concrete (Karababa and Pomonis, 2011). There is still damage present from the 2003 earthquake on Lefkada.

Lefkada is slightly poorer than the average Greek household and poorer has less production and income than some of the more popular Ionian islands. Lefkada relies greatly on tourism for income. Pictures of missing beaches following landslides may have a greater economic impact than the earthquake itself.

What have been the 2 largest comparable damaging events in the past?

Date - Name	Impact Size	Damage %	Social % or Insured %	Economic Loss
1948 Lefkas	Int 9-10	~300 dest., 1000 dam.	2 deaths, 45 injured	Unknown
14.08.2003 Lefkas	Int 8	4211 damaged	50 injured	Ca. \$50m

There were also very damaging earthquakes in 1953 in Kefalonia and also many other smaller earthquakes causing damage. Lefkada has been left with major damage in 1577, 1612, 1613, 1625, 1630, 1704, 1722, 1723, 1769, 1783 (60 deaths), 1815 (many deaths), 1820, 1825 (60 deaths), 1869 (15 deaths), 1914, 1948, 1973, 2003.

Preferred Building Damage Information: (Damage states will be filled in later when more info available)

Description: Some buildings have been damaged with VII In southern Lefkas Island, there have been 20 uninhabitable, 120 houses damaged, with one death coming from a collapsed stable. On Ithaka (40 houses damaged) and Kefalonia there are also reports of building damages. These will be counted in the coming days but an estimation of 90% damage on Lefkas and 10% damage on other islands has been made in the media. Schools have been checked, and teaching resumes on the 23rd.





Twitter photos of damage

Secondary Effect Information: For weather impacts see http://www.wettergefahren-fruehwarnung.de/

Туре	Impact	Damage %	Social %	Economic %
Landslides	Some roads blocked	Minor	1 death	minor

Preferred Loss Estimation for Earthquake

Туре	Median	Туре	Description	Source
Deaths	1	Earthquake	1 shaking fatality expected (range 0 to 8)	Daniell,
Feenemieles	20mn USD	Earthquake	Range from 5-65 million USD depending on	CATDAT, EQ
Economic Loss	Zumn usb	Earthquake	model uncertainties used	Report.

^{*}The earthquake shaking losses are calculated using CATDAT EQLIPSE-Q by Daniell (2010); Daniell et al. (2011)

Current Loss Impact Information: \$million int. event-day dollars

Туре	Median	Accepted Range	Description	Source
Deaths	2	2	Deaths due to shaking and landslide	News
Injuries	8	6-10	2 seriously, 6 slightly	News
Total Loss	Unknown	Ca. \$5-100m	Rapid ELE models	CATDAT

Abridged Summary Description from full CATDAT description sources:

CATDAT Economic Index Rank: 6: Damaging CATDAT Social Index Rank: 6: Major						
minor event compared to past disasters in the area such as 1948, 1953 and 2003.						
A strong earthquake has hit Lefkas Island with 2 fatalities and much damage across the area. This is a						

This report was produced in conjunction with the CATDAT database, CATNews, earthquake-report.com, EMSC and USGS data. As shown below is full size documentation of the diagrams shown in the summary above. The data is current as of 23rd November 2015, 7:00am European Standard Time. For the current data, go to www.earthquake-report.com.