The French Tsunami Warning Center: CENALT
The CENALT:

- Warns French civil security authorities, within fifteen minutes of a potentially tsunamigenic event occurring in the West Mediterranean Sea or in the North Eastern Atlantic Ocean, transmitting pertinent parameters of the event.

- Advises within 15 minutes NEAM candidate tsunami watch providers, national tsunami warning centres and tsunami focal points.

- Sends confirmation/cancelation messages: latency related to the tide gauge data availability.
Centre d’alerte aux tsunamis : principle

Event detection

CENALT Bruyères-le-Châtel

Results validation by expert on duty 24/7; Messages préparation and dissemination

Civil Protection → Public alert → Beaches and harbours evacuation

Seismic Network

Data Processing detection, location magnitude Tsunami measurements

Tsunami confirmation

Tide gage network

IN OPERATION SINCE JULY 1 2012

2 mn 5 mn 10 mn 15 mn 60 mn
Secured operational network

Continuous real time data exchange:
- Seismic
- Tide gage (SHOM 1s sampling – other 1 min sampling)

Private telecommunication network for data transmission and message dissemination
Sea level network (SHOM)

- 41 sea level available at IOC web page
- 41 sea level data transmit to CENALT by VPN
- 28 send by GTS
Activities conducted at CENALT since the begining of operations, 1st July 2012

- Monitoring activities
The CENALT is operational since the 1st of July, 2012 and has since then been active in monitoring earthquakes and sea level events.

- Tests and evaluation activities
Perform Monthly International communication tests

Perform Monthly exercise with French CPA

Perform internal exercise, self evaluation of our system and procedures by conducting crisis exercises.

- Operational computation and assessment
Regular test of computation of forecast arrival time and continuously daily assessment of the networks detection capacities
Sea level monitoring

Mediterranean

Waves observations

0.10m

Atlantic

3.70m
Alert processing at CENALT

Alboran Sea (25/01/2016), M 6,2
Origin time 04:22
Automatic detection and location +1min (04:23)
Message sent +8min (04:30)

National Alert (COGIC)
International Watch (12 MS / 15 institutions)

EMAIL
Fax
VPN

GTS
Event 25 January 2016
Map tsunami arrival time and alert level

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS
ORIGIN TIME - 0422Z 25 JAN 2016
COORDINATES - 35.53 NORTH 3.81 WEST
DEPTH - 10 KM
LOCATION - STRAIT OF GIBRALTAR
MAGNITUDE - 6.2

EVALUATION OF TSUNAMI ADVISORY
IT IS NOT KNOWN THAT A TSUNAMI WAS GENERATED.
THIS WARNING IS BASED ONLY ON THE EARTHQUAKE EVALUATION.
AN EARTHQUAKE OF THIS SIZE HAS THE POTENTIAL TO GENERATE A TSUNAMI
THAT CAN STRIKE COASTLINES WITH A WAVE HEIGHT LESS THAN 0.5M AND OR
CAUSE A TSUNAMI RUN-UP LESS THAN 1M.
AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS
POSSIBILITY.

THE CENTER WILL MONITOR SEA LEVEL DATA FROM GAUGES NEAR
THE EARTHQUAKE TO DETERMINE IF A TSUNAMI WAS GENERATED AND ESTIMATE
THE SEVERITY OF THE THREAT.
A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE
LARGEST. TSUNAMI WAVE HEIGHTS CANNOT BE PREDICTED AND CAN VARY
SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM ONE
TSUNAMI WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR, AND THE
THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

EVALUATION OF TSUNAMI INFORMATION
BASED ON HISTORICAL EARTHQUAKE AND TSUNAMI MODELLING THERE IS NO
THREAT THAT A TSUNAMI HAS BEEN GENERATED THAT CAN CAUSE DAMAGE OR
MAJOR EFFECT IN THE REGION; THIS MESSAGE IS FOR INFORMATION ONLY.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS WITHIN
THE WATCH AREA ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND
THE INITIAL WAVE MAY NOT BE THE LARGEST. TSUNAMI IS A SERIES OF WAVES
AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.
LOCATION FORECAST POINT COORDINATES ARRIVAL TIME LEVEL (ADVISORY, WATCH)

UNITED KINGDOM - GIBRALTAR 36.13N 5.35W 0449Z 25 JAN ADVISORY
SPAIN - CEUTA 35.89N 5.32W 0451Z 25 JAN ADVISORY
SPAIN - MALAGA 36.72N 4.42W 0433Z 25 JAN ADVISORY
SPAIN - ALGECIRAS 36.18N 5.40W 0453Z 25 JAN ADVISORY
SPAIN - MELILLA 35.28N 2.94W 0455Z 25 JAN ADVISORY
SPAIN - ALMERIA 36.84N 2.47W 0457Z 25 JAN ADVISORY
SPAIN - CARTAGENA 37.61N 0.94W 0516Z 25 JAN ADVISORY
SPAIN - CADIZ 36.53N 6.29W 0552Z 25 JAN ADVISORY
SPAIN - HUELVA 37.26N 6.95W 0620Z 25 JAN ADVISORY
MOROCCO - TANGER 35.79N 5.80W 0503Z 25 JAN ADVISORY
Cannes town hall council managed the crisis with the contribution of COGIC and CENALT to proceed to:

1. Harbour, beaches and coastal evacuation with mitigation measures

2. Crisis management during tsunami propagation

3. Emergency and mitigation measures after tsunami waves impact
Map of evacuation roads
Road signs
Refuge buildings and place refuges
The CENALT is fully operational since the 1st of July, 2012 and is monitoring the Western Mediterranean Sea and the North-Eastern Atlantic Ocean for the tsunami hazard and risk.

CENALT sent:
- 3 tsunami advisory message (25 Jan 2016)
- 50 tsunami information messages since July 2012.
Alert WATCH and ADVISORY

<table>
<thead>
<tr>
<th>Run-up</th>
<th>Avis Advisory</th>
<th>Avertissement Watch</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1m</td>
<td>&lt; 1m</td>
<td>&gt; 1m</td>
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<tr>
<td>0.2-0.5 m</td>
<td>0.2-0.5 m</td>
<td>&gt; 0.5 m</td>
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| Impact                      | Courants, mascaret, retrait, destructions dans les ports, petites inondations sur les plages | Impact ‘Avis’ + inondations à l’intérieur des terres |

50 cm
Regional messages alert level

- In the Atlantic ocean several seismic zones are located at more than 1000 km from any shoreline.

- In case of advisory level (7.1 – 7.5), an advisory level message is not relevant: **all countries should be at information level**

- In case of watch level (7.6 – 7.8), a watch level message is not relevant: **all countries should be at advisory level**
Ridge with no regional level

1000 km
Ridge with no regional level