



**Project N. 037110**

**NEAREST**

**Integrated observations from NEAR shore sources of Tsunamis:  
Towards an early warning system**

**Instrument: STREP**

**Thematic priority: 1.1.6.3 GOCE (GLObal Change and Ecosystems)**

**D.30 Simulator for the decision maker authorities**

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Dissemination Level		
<b>PU</b>	Public	<b>PU</b>
<b>PP</b>	Restricted to other programme participants (Including Commission Services)	
<b>RE</b>	Restricted to a group specified by the Consortium (Including Commission Services)	
<b>CO</b>	Confidential, only for members of the Consortium (Including Commission Services)	



## **WP8 - Feasibility study and prototype for an EWS**

### **D.30 Simulator for the decision maker authorities**

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The Simulator was developed by Xistos under the coordination of Herculano Caetano, with the contributions from all NEAREST partners.

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**N.B.:** The software of the Simulator is provided to the Commission on a pen-drive and can be downloaded from NEAREST Web Site: <http://nearest.bo.ismar.cnr.it/>

# SYNTETIC PRESENTATION OF THE TSUNAMI NEAREST SIMULATOR

## 1. Introduction

The NEAREST Simulator is a modular and open tool. This double characteristic makes the tool particularly adequate for a tripe utilisation:

1. As an evaluator of the consequences of an event, being able to generate the human and environmental impacts and also to receive information and data from other systems by the exchange of xml type files.
2. As a training tool for the local and regional emergency services. Using the simulator the operators will gain insight on the dimension of the ongoing phenomena (arrival time, water height, evacuation time).
3. As a decision support and operational tool.

## 2. The main functions of the NEAREST Simulator

The Tsunami Simulator NEAREST is a tool that allows:

- To model a geomorphologic environment that may generated earthquake and tsunamis (active faults)

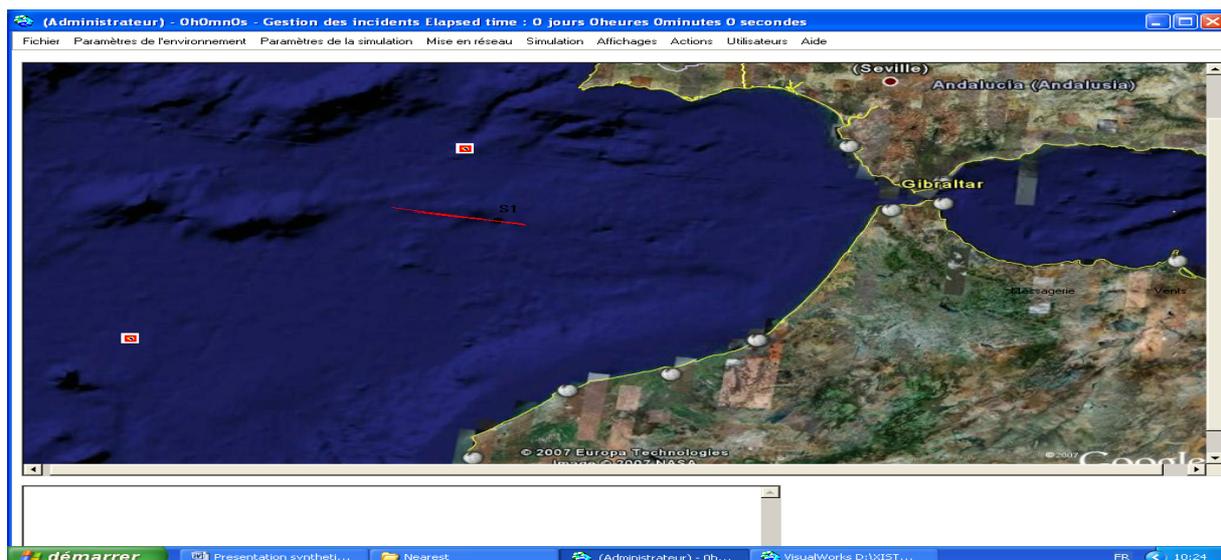


Figure 1 – Example of one model of a tectonic framework in the study area. The red line shows the modelled tsunamigenic fault. The red squares simulate the pressure gauges that are connected to the Regional Tsunami Warning Centre.

- To model the social and urban environment of the areas subject to the earthquake and tsunami

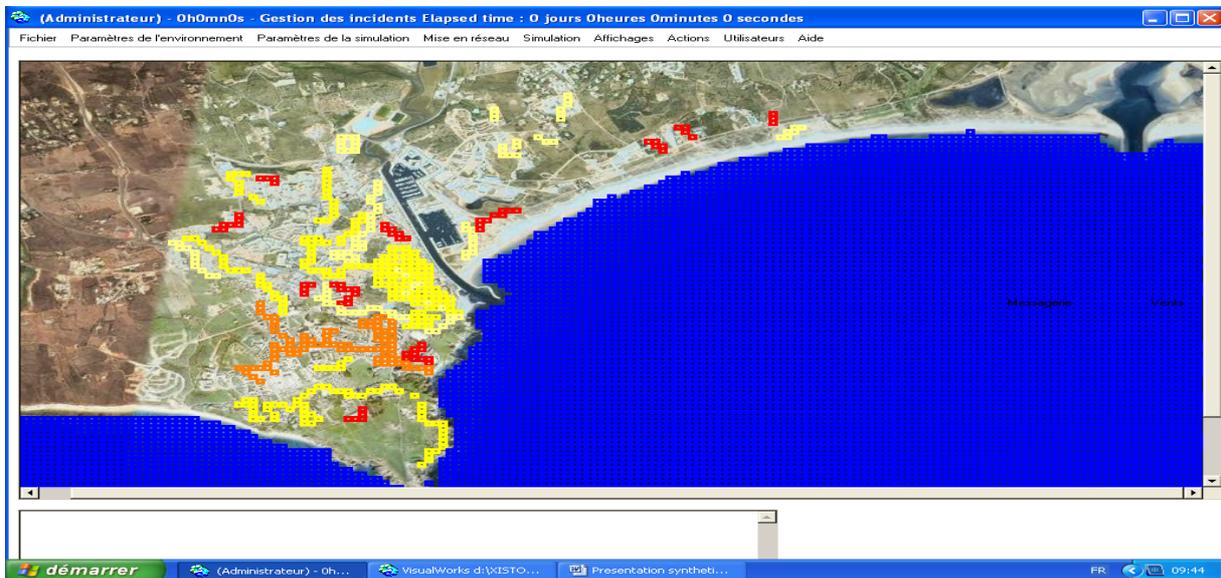


Figure 2 – Partial display of the social and urban model for the Lagos town (Algarve, Portugal)

- To generate estimates of the consequences of the earthquake and tsunami impacts

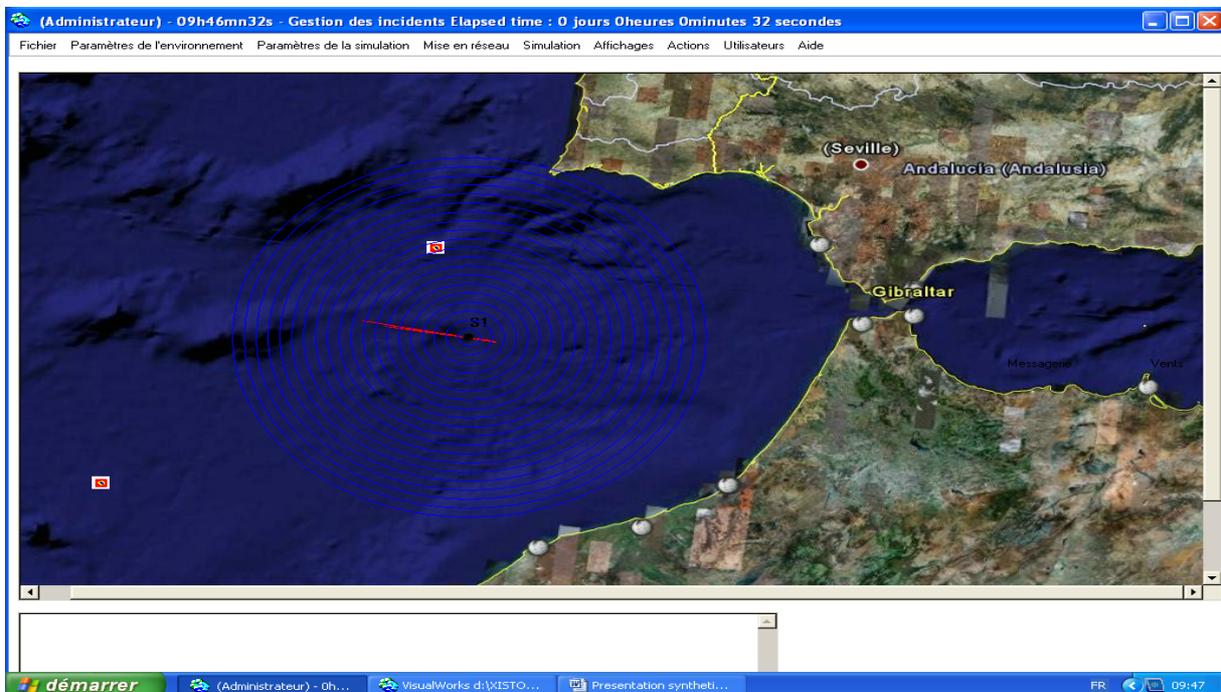


Figure 3 – A magnitude 8 was generated at the active fault previously defined. The concentric blue circles illustrate the propagation of the seismic waves.

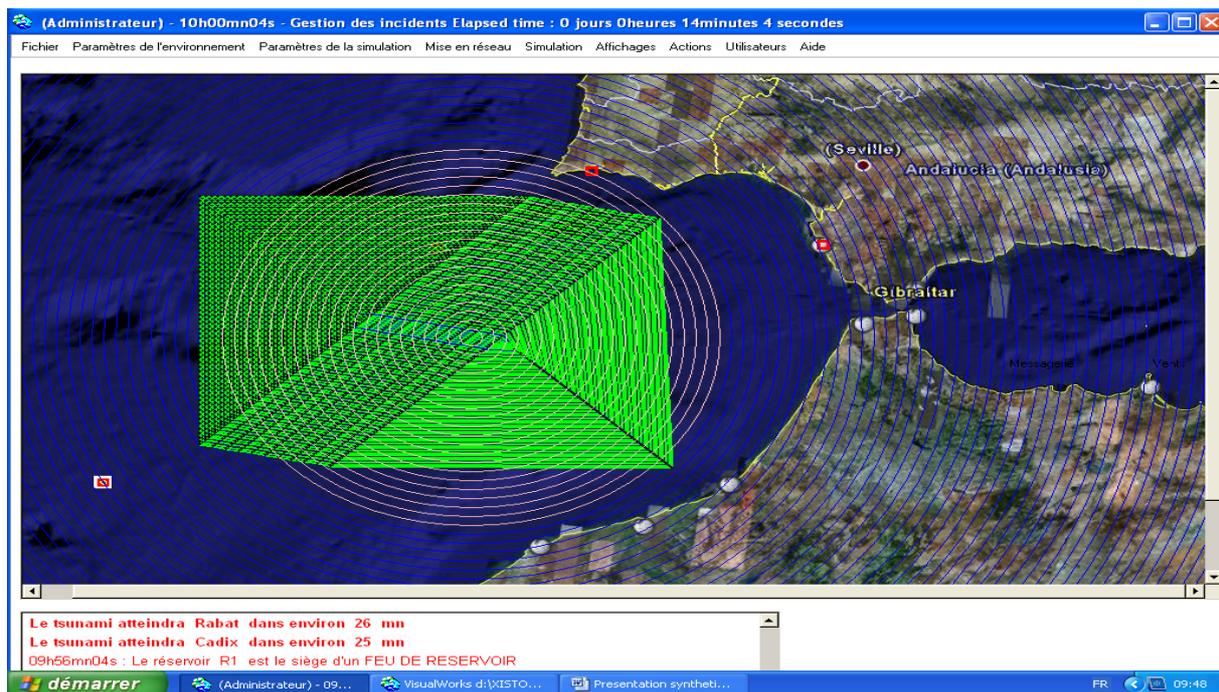


Figure 4 – Modelling the tsunami waves that follow the earthquake (in green). The text on the bottom screen (left) provides real-time information to the operator on the time the tsunami will take to reach the coastal areas.

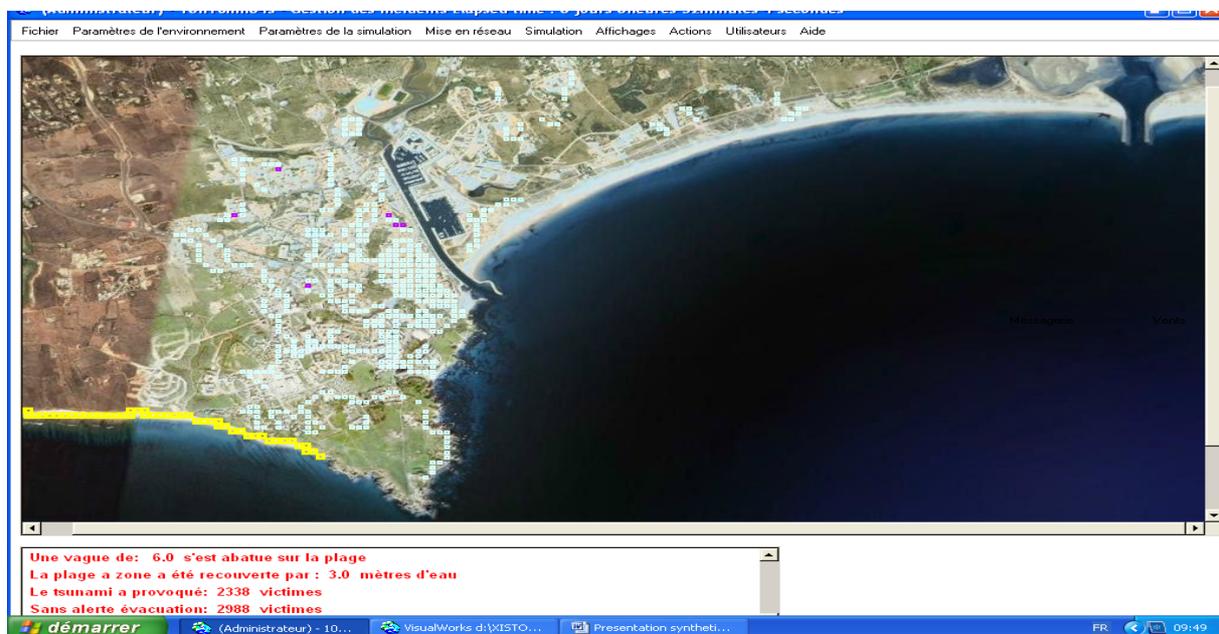


Figure 5 – Model for an estimate of the consequences of the earthquake (destruction of buildings and number of victims) and the effect of the tsunami along the coast at the Lagos beach (in yellow).

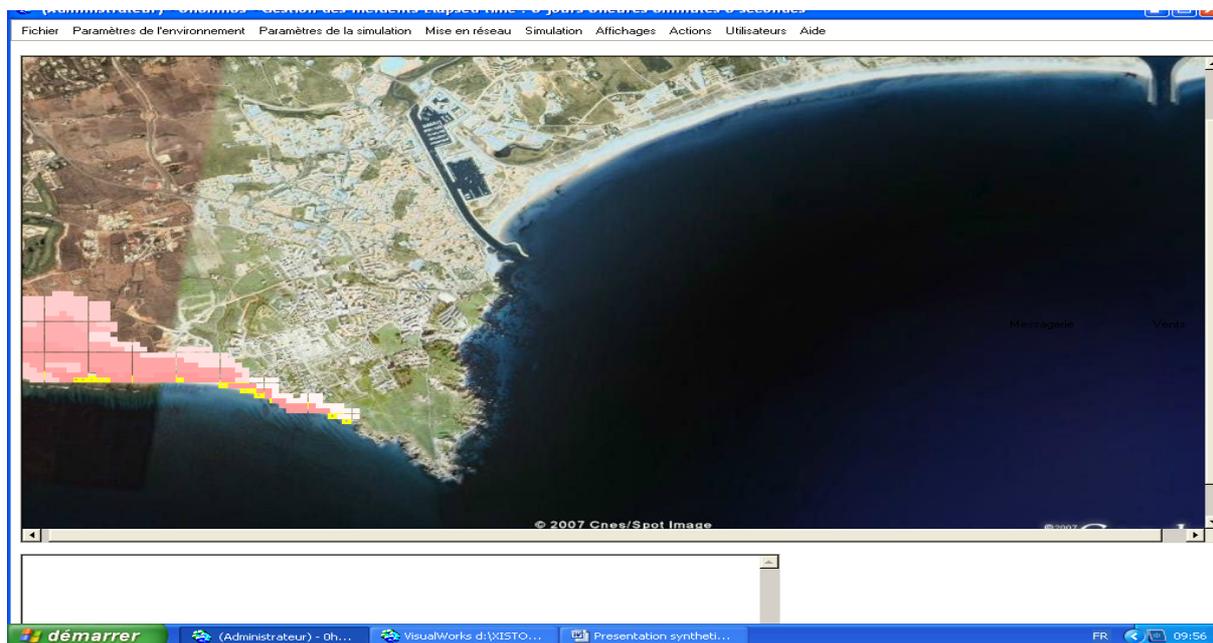


Figure 6 – Consideration of topography at the disaster site. The colour scheme, from white to pink, shows elevation variations from 0 to 100 m.

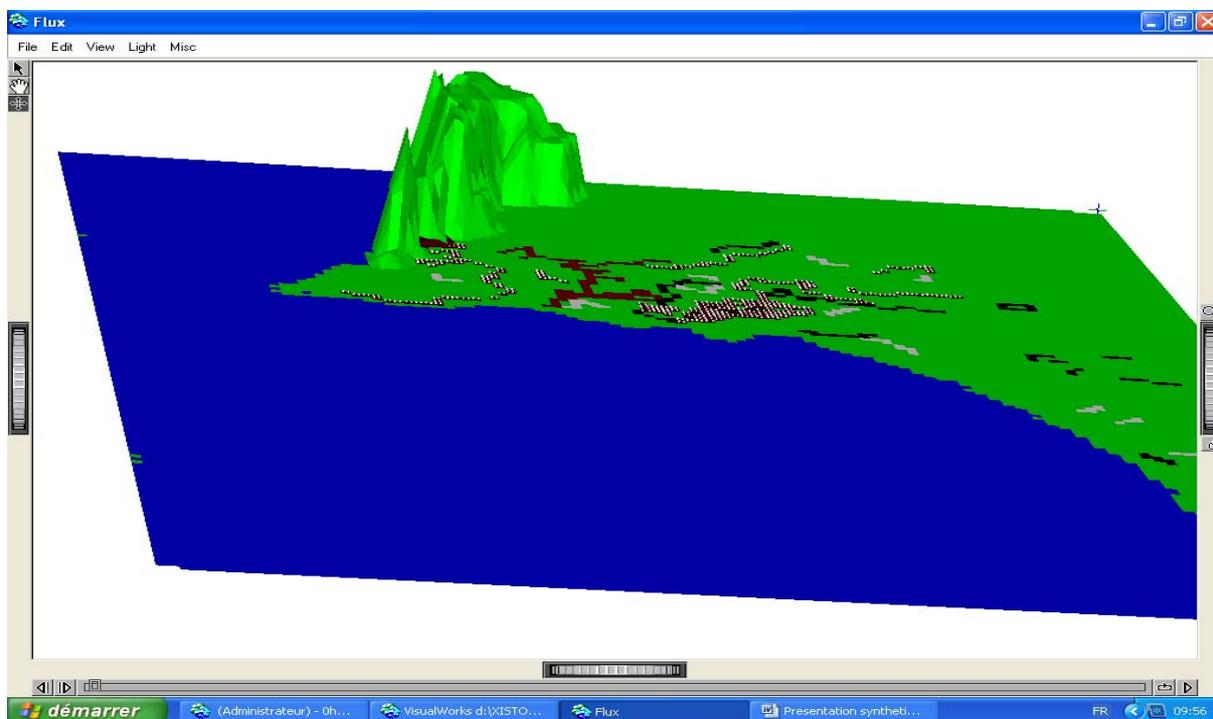


Figure 7 – Generation of a 3D model for a disaster site considering the topography and human occupation.

### **3. Conclusion**

The NEAREST Simulator is an operational tool that can be integrated either into a national warning system or it can be ported to the field to help the management of emergency and rescue operations and as a decision support tool. The software of the Simulator is provided to the Commission on a pen-drive and can be downloaded from NEAREST Web Site: <http://nearest.bo.ismar.cnr.it/>