European Commission
Joint Research Centre
Institute for the Protection and Security of the Citizens
Global Security and Crisis Management Unit

Ispra, 22 Mar 2012

To: Dr. George Pararas-Carayannis
Editor, International Journal "Science of Tsunami Hazards"

Subject: Request for Publication of a paper in Science of Tsunami Hazards Journal

Dear Dr. Pararas-Carayannis

During the analysis of the Tohoku Earthquake and the comparisons of sea level measured by the tidal gauges, GPS floating buoys and cable bottom pressure, I have realized that all these measurements were strongly influenced by the presence of subsidence due to the earthquake. Also I have verified that taking into account this influence is particular important in order to obtain a coherent and reliable source inversion determination.

Therefore I wrote a paper that explains how to estimate the effect of the subsidence on the measurements and how to correct the measurements. At the moment all the scientists are trying to estimate the source without considering this correction; as I think that this correction is very important I am asking you the possibility to publish the article in your journal so that also other can benefit from the application of this correction procedure.

The paper is entitled: "Sea Level Signals Correction for the 2011 Tohoku Tsunami", by A. Annunziato and this is the paper abstract

ABSTRACT

The paper analyses the signals measured during the M9.0 Tohoku Tsunami in order to identify the effect of the subsidence on the measurements and determine correction factors to be applied to the measurements. The objective is to have a coherent set of measurements that can allow the correct estimation of the source term for this event through inversion techniques. Infact the inversion techniques tend to minimize the difference between the measured signals and the calculated value; which means that in the initial period and also for the peak, the solution found without considering this correction tends to get higher values of the source (the peak in some cases is almost 1.4 m higher on a maximum of 4-5 m, thus is not negligible).

The amount of the correction has been determined using the long term displacement shown in the measurements; the subsidence estimates are also compared with the values obtained using GPS instruments. The analysis shows that the subsidence has a notable influence on the measurements where the deformation is large and that taking into account the deformation in the signals may improve the quality of the estimation of the initial deformation.

With my Best Regards

Alessandro Annunziato (signed)

Encl.: full paper "Sea Level Signals Correction for the 2011 Tohoku Tsunami", by A. Annunziato