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Marine Extremes and Natural Hazards: when the key is variability.

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At EGU2013 we used the work we are conducting regarding marine extreme events and natural hazards to exploit the distance that separate the scientific community and the non academic society, trying to show where bridges need to be built an how an ethical behavior among the scientists needs to be in place to succeed. We concluded that our actions as scientists have not been the most appropriate in communicating outside the academy our results, particularly when our findings have to do with natural hazards which could contribute to loss of life and the environmental quality that sustains it. Even if one of the barriers that separate the academy from society is the "language", too cryptic even for a well educated (not scientific) citizen in many cases, we scientists complicated even more the problems when we stop worrying about some basic concepts regarding the scientific method once upon a time were teach at basic school levels, particularly concerning differences as accuracy and precision, or the concept of uncertainty and the errors which permeate any observation or scientific "prediction". Science teaching at basic levels was not lost, but changed in the XXth century, concentrating in the so many new advancements and abandoning classical but necessary learning processes just about how sciences is done and why.

When studying marine extreme events, we use statistic, stochastic methods, deterministic analysis, logical and numerical modeling, etc. However, our results are still very far away of being accurate, while our precision, however is improving just a little, it is still far away of ideal. That appears to be somehow obvious if we look just the observed vs. the modeled data. Nevertheless, if we look not the absolute values of our results, but the "rhythm" of their variability and compare these cadences with the beats observed in nature, new patterns arose, and clues about how to act regarding natural hazards and extreme events became more clear. We are being able to reproduce the natural variability of the coupled ocean-atmosphere system, simulating its behavior in terms of its variability (beats and cadences) and even their regimes (rhythms), including their changes. Not all is deterministic, but not all is chaos. Some beats we could predict today, some other cadences could not be ever forecasted, but our acknowledge of those pulses and the regime dynamics will be fundamental to help in reducing the damages such marine extreme events could promote.

Our ethic responsibility is to get ways of communicate our findings outside the academy under the basic concept that sciences is not about producing certainties, but it is about reducing uncertainties. That is a mandatory ethical behavior we have to follow. In other words, and borrowing some experience from the insurance industry, we have to be clear that we know that in a given road it will be a car accident per month, but we have no way to say whose car will be the one.

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