Review of: "[Perspective] Combatting Relative Sea-Level Rise at a Global Scale: Presenting the International Panel on Land Subsidence (IPLS)"

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Potential competing interests: No potential competing interests to declare.

The work is a report about a most timely initiative. I fully agree that the efforts up to now to address the problem of land subsidence and sea level rise and to mitigate the combined effects were not sufficient and that an international panel is necessary to group all the activities worldwide. I propose to publish the paper as it stands.

A specific example of the effects of SLR refers to the shoreline of the Upper Adriatic Sea, in particular that of the Province of Ravenna in Italy. For instance, a noteworthy event happened on February 5 and 6, 2015, in the coastal region surrounding Ravenna and extending southwards, with exceptional flooding represented by the invasion of sea water and river flooding. This flooding resulted from heavy rainfall and continuous exceptionally high sea water for 15 hours (see Figure 1).

Figure 1: Area affected by the heavy rainfall and storm on February 5 and 6, 2015, modified from (Ortolani, 2015).

Gas fields Angela-Angelina, Ravenna Mare Sud, and Cesenatico Mare, with their respective land subsidence bowls, are

located offshore in front of the affected coast. Data for the subsidence about Angela-Angelina suggest that a localized impact on this flooding, stemming from surface lowering due to this field directly offshore, should not be overlooked and should be further investigated (see Figure 2). For instance, the interaction of a man-induced subsidence bowl directly in front of the shore and the wave regime is totally unknown. As far as this subsidence bowl is concerned, it appears from Polcari et al. (2022) that in 2015, the land subsidence measured approximately 15 cm onshore at Fiumi Uniti and 25 cm at the producing platform. Beyond the direct impact of land subsidence on the lowering of the coastline, the subsidence bowl along the coastline, with a diameter of about 15 km as predicted by Teatini et al. (1998) for 2014 (see Figure 2), has the potential to permanently modify the wave regime, thereby contributing to the occurrence of floods.

It is in fact known that with the resulting increase of depth, the height of the waves increases too and that the energy carried by the waves increases with the square of the height, and the destructive potential of the waves does too. Hence, modelling of these phenomena is urgent. A further aspect refers to the effect of the altered solid transport by local subsidence. This affects the evolution of the shorelines. This is unknown too.

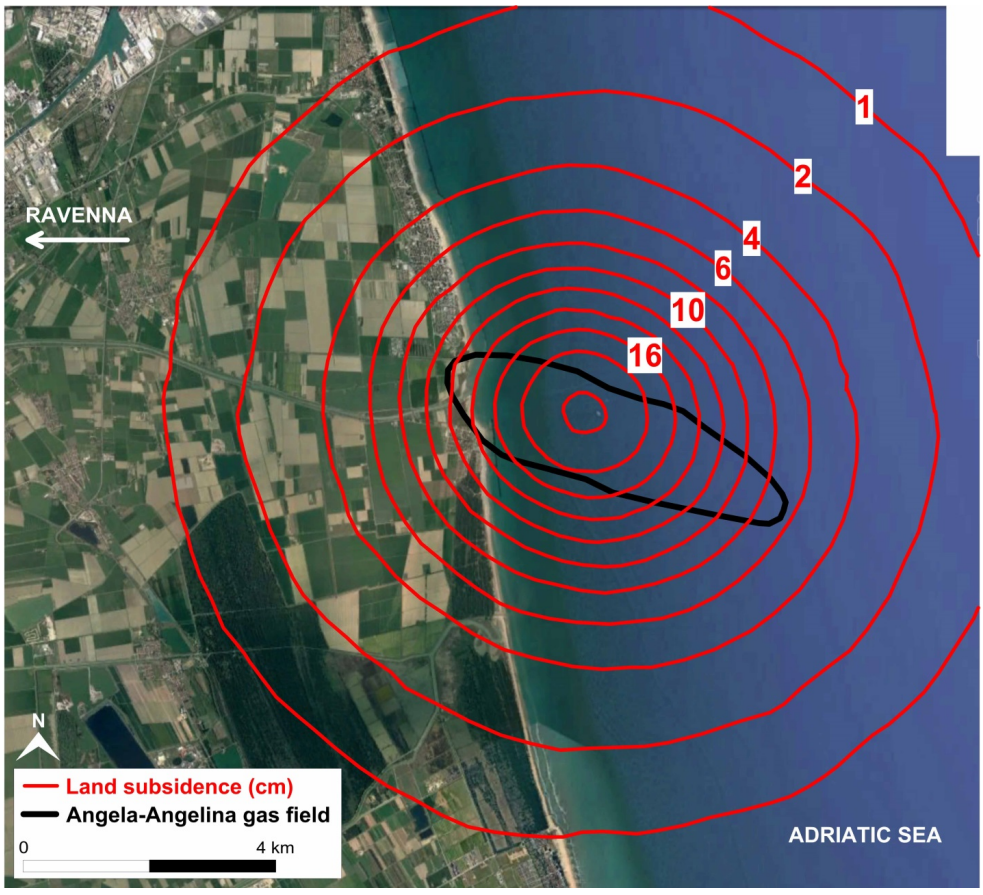

Figure 2: Subsidence bowl at the Angela-Angelina field as numerically predicted for 2014 by Teatini et al. (1998). The trace of the largest pool is also indicated. Note the huge diameter of the bowl in this case; modified from Fabris and Schrefler (2024).

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