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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Projecting the risk of damage to reef-lined coasts due to intensified tropical cyclones and sea level rise in Palau to 2100" *by* Chuki Hongo et al.

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Reef workers Âń know Âż from empirically supported data that the decrease in coral calcification and reef accretion in the next future might result in a decrease in the ability of reef-crest and reef flat zones to reduce wave energy and to maintain coastal protection. The present paper by Hongo and associates has the merit of quantifying the responses of a given reef (Melekeok reef, Palau Islands) to the expected rise in sea level and intensification of typhoon activity during the next decades, according to three RCP scenarios. I agree with the authors regarding the remarkable building power of corymbose acroporids that make up upper fore-reef, reef-crest and outer-reef flats in most high-energy reef environments. The fact that that Acropora forms belonging to ro-

busta group are amongst the most robust branching corals and corals with the highest vertical growth rates in the considered domain suggests that the relevant reefs would be able to compensate for significant changes in sea level and typhoon strength. By contrast, I am sceptical about the capacity of arborescent acroporids typified by gracile branching colonies to resist higher water energy ; I guess the relevant reef-crest zones will suffer from storm surges of increasing strength. I particularly appreciate the section dealing with Âń Estimation of future reef production rate Âż ; the presented data provide a robust estimate of the growth potentiality of the acroporid facies. However, I am surprised to see that there would have Âń no significant upward reef growth in response to changes (increase) in the water level (WLs) Âż (page 9, lines 15-16). And I do not see how porous framework with high permeabilty degree could prevent upward accretion. Examples from the literature reveal that the highest vertical reef growth rates relate to porous branching corals, especially robust branching ones. It would be interesting to assess the role of massid coral forms (e.g. poritids, faviids) in reef resistance to increasing wave energy, since a number of reef fronts in the Indo-Pacific province are dominently composed of such builders.

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