Review of: "Identifying wastewater management tradeoffs: Costs, nearshore water quality, and implications for marine coastal ecosystems in Kona, Hawai‘i"

Goran Volf[1]

1 University of Rijeka

Potential competing interests: The author(s) declared that no potential competing interests exist.

General: This study discusses a systems approach that was developed to link land use decisions such as development, water use, wastewater treatment, nutrient fate and transport processes in groundwater, and nearshore marine health. The modeling framework in this study consists of three models coupled with an assessment of potential impacts to the marine habitat. Firstly there is groundwater recharge that feeds into the groundwater model, while land use and wastewater management scenarios are concurrently applied to the groundwater model domain to generate groundwater nutrient concentrations. Then, authors by using the simulated nutrient concentrations coupled with spatial information about depth and wave power, the marine water quality model generates maps of changes in marine water quality in terms of nutrient loads and feeds into the assessment of potential impacts to the marine habitat. Finally, authors through this approach produces maps of potential marine habitat impacts, and all of the model outputs (i.e., change in GW and marine WQ) that are compared to one another using the costs associated with the considered management scenarios. Authors developed total of eight scenarios by combining different assumptions about future land development, water demand, cesspool conversion extent and technologies, and municipal WWTP upgrade status. Authors results suggest that converting all of the existing cesspools to aerobic treatment units and upgrading the existing WWTP to R-1 quality provide the highest protection to nearshore marine habitat at a cost of $569 million in present value terms. Authors says that other wastewater management options were less effective but also less costly, and that the model outputs also suggest that the spatial distribution of potential impacts should be carefully considered when comparing different wastewater management scenarios. Also, authors discuss that when evaluated separately, the WWTP option reduced total nutrients by more than the targeted cesspool conversion option at a fraction of the cost. However, authors says that potential improvements in marine habitat quality only occurred in the immediate vicinity of the WWTP, whereas the benefits under targeted cesspool conversion were more evenly distributed along the coast.

At The End: After all, this study deals with an interesting topic and gives a presentation of the results in a understandably and friendly way.

Some suggestions: It would be better for readers that authors presents general figure for *“Modelling*

procedure" and write "*Conclusions*" in separate section, with combing section "*Results and Discussion*". Also authors should devote more text in sections dealing with the description and use of individual models so that modelling procedure would me more understabale.

BR