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Biogeosciences Discussions

Interactive comment on "Groundwater and nutrient discharge through karstic coastal springs (Castelló, Spain)" *by* E. Garcia-Solsona et al.

Anonymous Referee #2

Received and published: 12 March 2010

Overview: The authors present nutrient and radium data from the coastal ocean near Castello, Spain. The data suggests groundwater discharge from submarine karstic features is an important material vector to this section of the coastal ocean. I feel that the research topic is inline with the goals of Biogeosciences. The sampling approach is well thought out and the analytical procedures are inline with the proposed study. With this said, there are some modifications that would make this manuscript much stronger, they are highlighted below.

Main Comments:

Comment 1: While for this manuscript it seems to work, do to the short residence times of the coastal water, I would prefer that "mixing lines" be established using chloride or salinity not radium. Again, this point is somewhat irrelevant for this system as the

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main process affecting Ra distribution in the coastal ocean is dilution. However to be consistent with other studies with estuarine-like gradients, it would be beneficial to look at nutrient behavior relative to something other than Ra.

Comment 2: Comment 1 brings me to comment 2. Why do Ra-223 and -224 have a linear relationship with salinity? Is there an offshore source? If not, then equation 5 is probably not applicable to this system as to use it, would assume that variations in the AR and ultimately the activity of 223 and 224Ra is time, but the linear plot suggests dilution and mixing is occurring faster than decay.

Comment 3: Broaden the discussion. As it reads, a lot of the discussion section is simply an extension of the results.

Comment 4: Combining Comment 2 and 3 would make for a great discussion section. i.e. why does the radium age model not work well in karstic systems or point discharge systems. Peterson et al. 2009 recently used radon as a tracer for areas where SGD occurred as point discharge; the number of assumption used by Peterson et al. how translatable are some of these techniques to different sites.

Minor Comments:

P 632 line 19: delete “be affected by”

Figure 8 should be an inset to either Figure 1 or Figure 2.

Figure 9 the legend is really difficult to make out.

Interactive comment on Biogeosciences Discuss., 7, 631, 2010.