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Hydrology and Earth System Sciences Discussions

Interactive comment on "Parameterization and quantification of recharge in crystalline fractured bedrocks in Galicia-Costa (NW Spain)" *by* J. R. Raposo et al.

Anonymous Referee #1

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The manuscript deals with estimation of recharge with a water balance model in hard rock regions, which is a challenge in hydrogeology and makes the contribution significant. The results are cross-validated with the chloride mass balance technique. The strength of the work is the comparison of results from nine investigation areas and the systematic analysis of the data and results. The assumptions seem to be valid and interpretations are supported by the analyses. The research is of interest for everybody dealing with the estimation of recharge and groundwater management in hard rock regions with a limited access to a distributed database. The weakness of the article is the presentation of the applied hydrological model and the sensitivity analyses. The authors should improve process description, parameter descriptions and parameter

consistency between figures/tables.

Specific Comments 1920 - 3 Please specify: "high heterogeneity" for example, of the hydraulic parameter field

1920 - 13, 1929 - 14, etc. "Chloride" to "chloride"

1921 - 22 "de" to "the"

1921 - 23 "Spanish Water Administration" instead of "Spanish water administration"

1922 - 17 "estimates" to "estimate"

1922 - 18 check grammar of the sentence

1923 - 9/10 check grammar "large uncertainty in quantify the recharge in all Galicia-Costa"

1924 - 11, 1951, etc. "District" to "district"

1924 - 19 "Cl" to "chloride" or "Cl-"

1925 - 9, 1927 -3, etc. "Hydrologic District" to "hydrologic district"

1925 - 17,19 "Groundwater Bodies" to "groundwater bodies"

1925 - 24/26 38% + 54% = 92 %, what is with the remaining 8 %?

1926 - 8/10 "Because the Galician aquifers are highly rain-recharge dependent and the residence time of the water in these aquifers is very short" - statement without reference

1927 - 17, 1930 - 14, etc. "sunny hours" to "sunshine duration"?

1929 F_c seems to be an important parameter –> please check its influence with a sensitivity analysis, there is no access to the cited master thesis Alcala (2005), which is the source of the parameter value

1931 -1 "Thornthwhite" to "Thornthwaite"

1931-23/24 "Curve number" to "curve number"

1931-23, 1974 Are the calibrated parameters in the range of literature values? (For example, is the calibrated aquifer storage coefficient in the range of literature values from pumping tests?)

1939 How does the parameter sensitivity change between the different catchments?

1948 Table 1: The aquifer storage coefficient is zero for some of the catchments? Why do you calibrate an aquifer recession coefficient for these catchments?

1952 Legend of abbreviations is missing. Inconsistence: recession coefficients (table 1) etc. are not shown. The figure should be replaced by a figure, which shows the calibration parameters in table 1.

1954 Please explain the reason for the simulated water level plateau in Figure 4b?

Figure 3, 7, 9 Scale is missing

Figure 4 Please check precipitation "(mm)" to "(mm/. . .)"

Figure 7 "Groundwater" to "groundwater", legend symbol of bibliographic data and field campaign data is difficult to distinguish

Figure 10 Please compare the parameters with table 1 and use the same descriptions (e.g. soil depth vs. soil thickness). Why does the FC end at 50 CP(%)? Please explain CP and AS also in the caption or figure.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 1919, 2012.