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Hydrology and Earth System Sciences Discussions

Interactive comment on "Rainfall-runoff modelling and palaeoflood hydrology applied to reconstruct centennial scale records of flooding and aquifer recharge in ungauged ephemeral rivers" *by* G. Benito et al.

Anonymous Referee #1

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This is a very good to excellent manuscript that combines diverse methods into a nover approach to solve a common problem in arid ephemeral stream hydrology with emphasis on ungauged basins in arid to extremely arid basins. It also refers to what flood produces recharge and connects us to the impact of climate change on water resources at the edge of water availability in deserts. It undoubtedly should be published.

I have only minor comments that should be viewed mainly as suggestions. p 9633 L10: better..stations in the upper.. l17 extreme floods, l19-21 ... limited by flood du-

rations and by the limited storage... prior to each flood. l21 floods of 10-20% annual exceedance (120-140 m..) flow for $\sim$ 12 days l23 add at the end of abstract something like: Such limitations of storage capacity relate to ootential recharge by largest floods is common in arid areas and is reduced with increaing depth to ground water or river length.

p 9634 l 1 e.g., Benito et al l 5 dryland flood and recharge hydrology l 11 1977; Enzel and Wells, 1997; Tooth, 2000) l 13 ... 1995) to others. l 13 ...river hydrology, following others (e.g., Greenbaum et al., 200X; Morin et al., 2009) we propose an improvement of a l 22 e.g., Benito et al., 2010 l 23 add refs after FFA line 24 floods required (erase events)

p 9636 line 6 add ref for geology l 14 erase events l 24 Fig. 1); the latter is the...

p 9636 line 4 something is not clear enough with the numbers: clarify better

p 9637

l 29 erase event

p/ 9638

l 3 was focused on the paleoflood...

p 9640

l 7 all three floods occurred between... l 23 394 mm; +94 % or + X SD of annual rainfall). l 27 Since then, the mean decadal precipitation is much lower (Fig. 5)

p 9641 l 6 synthetic ? line 14 in-channel sediment l 15 with calculated water... line 20 Figs. 8a1..

p 9642

line 9 increment ?? line 10 fact, discharge quantiles provided ? line 18 sedimentation created a lower line 21 ca. 1% flood (I actually suggest using percents rather than RT)

line 22 10%

p 9644 l 10 1972; Enzel and Wells, 1997; Morin et al., 2009; Benito et al., 2010 l 14 management (Benito et al., 2010) l 25 ..duration (Morin et al., 2009)

p 9644

l 6 ..peak discharge but this is alsop dependent on river length. l 17 relatively shallow (3-5.. l 18 ...2007) In other arid longer basins where ground water is deeper (e.g., the Mojave River in southern California; Enzel 1992; Enzel and Wells, 1997) recharge is highly dependent on magnitude.

p 9645 line 2 in-between flows is increasing salinity

p 9646 l 18 310 m3sec-1 and 510... l 23 yrs ?

p. 9647 line 2 aquifers in these relatively short ephemeral

add percent to table 1 and table 2

fig. 5 anomaly or simply use standard deviation?

fig 8a2 and b2 Annual exceedence probability (%)

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 9631, 2010.