Hydrol. Earth Syst. Sci. Discuss., 7, C2271–C2273, 2010
www.hydrol-earth-syst-sci-discuss.net/7/C2271/2010/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Spatial uncertainty assessment in modelling reference evapotranspiration at regional scale" *by* G. Buttafuoco et al.

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Received and published: 13 September 2010

Dear anonymous referee #2,

We thank you for your comments/corrections and the judgment on the paper. In the following we report the answers to your comments:

Comment 1 - In paragraph 2 the authors introduce a linear function relating m(x), the expected value of the random variable Z(x), to the elevation, assumed as the smoothly varying secondary (external) variable; the authors should better explain the nature of the coefficients a0(x) and a1(x), in particular the dependence from the location x and

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the calibration procedure.

Answer 1 - In Kriging with an External Drift (KED) the $m(\mathbf{x})$is the drift which is usually modelled as a linear function of a smoothly varying secondary (external) variable $y(\mathbf{x})$:

$$m(\mathbf{x}) = a_0(\mathbf{x}) + a_1(\mathbf{x})y(\mathbf{x})$$

The two unknown coefficients $a_0(\mathbf{x})$ and $a_1(\mathbf{x})$ are deemed constant within the search neighbourhood and are implicitly estimated through the kriging system (Goovaerts, 1997, in paper bibliography). Unlike other approaches, the mean $m(\mathbf{x})$ is not estimated through a calibration or regression prior to the kriging of the unknown temperature values.

The phrase in page 4574 line 9 "...m(x) is the drift which is usually modelled as a linear function of a smoothly varying..." will be modified as "...m(x) is the drift which in Kriging with an External Drift (KED) is usually modelled as a linear function of a smoothly varying...".

After the formula (3) the following phrase will be added: "where the two coefficients $a_0(\mathbf{x})$ and $a_1(\mathbf{x})$ are deemed constant within the search neighbourhood and are implicitly estimated through the kriging system (Goovaerts, 1997)."

Technical correction 1 - In equation (4) at page 4575 the symbol "L" should be substituted by "i".

Answer to technical correction 1 - The correction is right: the symbol "L" will be substituted by "i".

Technical correction 2 - At section 15 of page 4575 "Zs(xc)" should be "Zs(xi)".

Answer to technical correction 2 - The correction is right: "Zs(xc)" will be substituted by "Zs(xi)".

Technical correction 3 - At section 10 of page 4576 If N is not equal to n, the symbol N should be introduced.

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Answer to technical correction 3 - The correction is right: “N” will be substituted by “n”.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 4567, 2010.