

Interactive comment on “Mapping current and future European public water withdrawals and consumption” by I. Vandecasteele et al.

Anonymous Referee #2

Received and published: 11 October 2013

This paper assesses pan-European public water withdrawals for 2006 and forecasts up to the year 2030, highlighting the considerable variations both within and between the various countries. Overall, I found the topic interesting and I believe it is within the scope of this journal. However, I have the following specific comments which if addressed I believe will improve the overall quality of the paper.

A key concern lies with the assumption that water withdrawals per capita will remain constant over the time period. The authors themselves state that this may have led to overestimations regarding the results. The forecasted percentage change in public water withdrawals across some countries appears to be particularly large e.g. Ireland at 53%. Whilst the present study forecasted withdrawals based solely on population and tourism projections, it is important to consider that many countries are currently

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undergoing considerable water sector reform in an effort to achieve greater water use efficiencies. For example within Ireland, a new national water utility has recently been established and a total of 1.1 million households nationwide will be fitted with a water meter with the aim of introducing domestic volumetric charging by 2015. This will have considerable influence in reducing per capita withdrawals in the coming decades. There are also significant investment plans to tackle the high leakage rate which in turn will reduce total demand.

Additionally, in the UK, where 39% of households are currently metered, the Environment Agency highlights projections that overall PCC will drop by 2040 and total demand will also decrease slightly despite population growth. This is due to a focus on tackling leakage rates together with an increase in water meter coverage and compulsory metering in certain water stressed regions. Details can be found in the latest EA bulletin:

<http://www.environment-agency.gov.uk/business/news/103450.aspx>

Overall, many EU countries are utilising or introducing a range of both pricing and non-pricing water demand mechanisms which will assist in reducing water withdrawals per user over the coming decades. Thus, whilst the paper appears to be coming from the perspective of a business as usual (BAU) approach in terms of using a constant per capita estimate, the indications are that many countries will experience an overall decrease in water withdrawals per user over the forecasted period. Accordingly, I believe it is important to incorporate this factor within the model when forecasting as it will improve the overall validity and value of the results.

Furthermore, in section 2.2 entitled ‘Forecasting to 2030’, there appears to be a contradiction in relation to the discussion of Figure 4 in which it is initially stated that ‘no clear general trend could be identified’. However, it is also acknowledged in the same paragraph that ‘Most countries actually show a reduction of per capita public withdrawals from 1990 to 2005.’ Figure 4 further confirms the need for this decreasing trend to be factored into models forecasting withdrawals up to 2030 rather than keeping per capita

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values constant.

The final section could be strengthened by discussing potential reasons as to why Bulgaria, Lithuania and Latvia are forecasted to experience a decrease in annual public withdrawals (Fig. 9) by 2030 whilst the remaining countries will experience an increase in withdrawals.

In addition to the specific comments above, I have the following minor comments:

P. 9890. L23: Reference '(EUROSTAT, 2012)' is not listed in the references.

P. 9891. L3: Rephrase sentence to 'Globally, domestic demand for water has been extensively studied and there have been numerous attempts to describe and model demand, although mainly at a local or regional level. At these scales, it is possible to take into account such factors as household income and size.'

P.9892. L11: Rephrase sentence to 'In this paper we discuss in detail the methodology used and present the resulting public water withdrawal and consumption maps for 2006 in addition to comparing them to 2030'.

P.9892. L13: Remove comma after 'statistics'.

P.9892. L14: Insert 'also' before assessed.

P.9893. L6: Change the word 'shows' to 'show'. Remove 'although' and insert a full stop after 'domestic purposes'. New sentence beginning 'A further 17% is used for industrial purposes and...'

P.9893. L9: Remove 'the' before 'public water withdrawals...'

P.9893. L10: Remove 'the' before 'other major water-using sectors...'

P.9893. L10: Change sentence beginning with 'Notable' to 'Interestingly, public water withdrawals...'

P.9893. L12: Change 'while' to 'whilst' and remove 'the' before 'total withdrawal'.

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P.9893. L13: Add 's' onto 'withdrawal'.

P.9893. L14: Reword the beginning of the sentence to 'Industrial and particularly energy withdrawals (used as cooling...'

P.9893. L15: Remove 'the' before 'eastern European countries.'

P.9893 L.26: Sentence too long. Insert full stop after '...in urban areas'. New sentence beginning 'Although, some commercial/service...'

P.9894. L1: Replace the word 'so' with 'therefore'.

P.9894. L6: Remove the word 'the' before '...public water withdrawals.'

P.9894. L8: Reference year for 'Batista e Silva et al. ' does not match year listed in references.

P.9894. L10: Define 'JRC'.

P.9894. L13: Insert a capital 'M' for 'modelling'.

P.9895. L8: Reference year for 'Batista e Silva et al. ' does not match year listed in references.

P.9895. L16: Reword sentence to 'For both cases, national statistics or regional averages are used where data is missing, always taking the closest...'

P.9895. L27. Reference '(Gössling et al., 2012)' is missing from the reference list.

P.9896. L19. (EUROSTAT) reference does not have a year listed but does in Figure 4 caption. Reference is missing from reference list.

P.9897. L18. Change word 're-calculate' to 'recalculated'.

P.9898. L20: Remove comma after 'Italy'. Also insert 'along' after the word 'and'.

P.9898. L24: Change sentence to 'Since forecasted land use was unavailable for these countries, we could not compute the 2030 water withdrawals.'

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P.9899. L13: Change 'area' to 'areas'.

P.9899. L25: Change to 'especially in coastal regions'. Remove the word 'the'.

P.9900. L10: Change end of sentence to '...might have an additional negative impact on resources.'

P.9900. L12: Remove phrase 'For the time being'. Reword sentence to 'In the present study we used country-level data for public withdrawals as available regional data is limited in its consistency and comparability.'

P.9900. L15: Change wording to 'Taking tourism into account reduces...'

P.9900. L23: Ireland should also be included in this list as it has an average leakage rate of 41%.

P.9905. Fig.2: In order to make the figure easier for the reader to interpret, I would suggest using different colours or more varied shading as some of the colours are less distinctive and it is difficult to gauge the per capita withdrawals for certain countries. Also in the figure caption, remove the word 'the' from 'Map of the public water withdrawals... 'and remove the comma after 'comparability'.

P.9906. Fig.3: Change caption to 'Sectorial water withdrawals as a percentage of total withdrawals across European countries for 2006.'

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 9889, 2013.