

CORRIGENDUM

On the influence of the freshwater supply on the Baltic Sea mean salinity

By JOHAN RODHE* and PETER WINSOR, *Earth Sciences Centre, Oceanography Section, Göteborg University, Box 460, SE-405 30 Göteborg, Sweden*

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1. Erroneous estimate of Baltic Sea mean salinity

The calculations of the Baltic Sea freshwater content in Winsor et al. (2001) were erroneous due to a fault in the hypsographic data used. This implied an erroneous estimate of the Baltic Sea mean salinity. (The estimate using the correct data is shown in Fig. 1 of this Corrigendum.) Rodhe and Winsor (2002) used their result in a calculation of the sensitivity of the Baltic Sea salinity to changes in the freshwater supply, and corrections have to be made to that paper.

The correct result indicates a somewhat lower sensitivity of the Baltic Sea salinity to changes in the freshwater supply than was suggested in Rodhe and Winsor (2002) (hereafter RW). The new result is shown in Fig. 3 of this Corrigendum. An implication of the lower sensitivity is that the discussion about at which freshwater supply the Baltic Sea will turn into a lake should be omitted, since the new calculations indicate that this will happen far outside the range in freshwater input, in which the diagnosis was made.

2. Detailed corrections

Page 174, the second sentence in the Abstract should be changed to: The average salinity of the Baltic Sea is about 7.7‰.

*Corresponding author.
e-mail: joro@oce.gu.se

Page 174, line 12: the sentence starting “We find . . .” should be replaced by: An estimate of the relation between the freshwater supply and the steady-state salinity of the outflowing Baltic Sea surface water is presented. The result indicates a higher sensitivity of this salinity to changes in the freshwater supply than previous studies.

Figure 1 of this Corrigendum should replace Fig. 5 in RW on page 178.

Page 178, a change in Fig. 6: the scale on the left vertical axis should be shifted 0.03 towards lower values.

Page 181, in the left column, first paragraph, third line from the bottom: $\Delta s = -0.25\text{‰}$.

Figure 2 of this Corrigendum should replace Fig. 9 in RW on page 182.

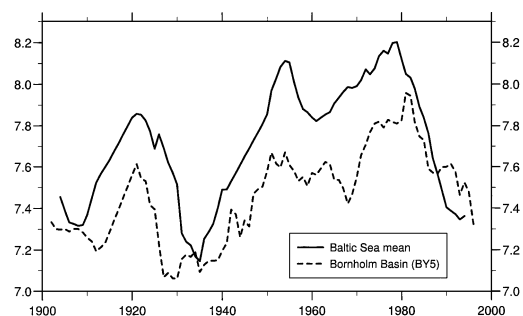


Fig. 1. Five-year running means of the mean salinity of the Baltic Sea and the surface salinity in the Bornholm Basin (corrected version of figure in Winsor et al., 2001).

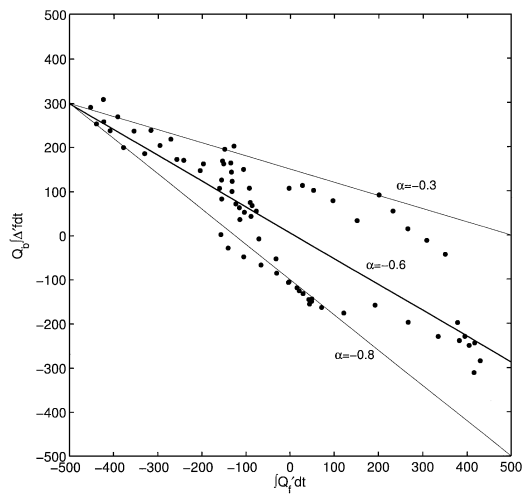


Fig. 2. The same quantities as in Fig. 8b in RW. Each dot represents one year. The figure illustrates the dependence of the perturbation from the mean of the background water in the inflow, $Q_b \Delta'f$ [calculated according to eq. (10)] on the perturbation of the freshwater supply, Q'_f . Slope (α) of the regression line and of two lines, indicating a reasonable interval for the estimate of a linear relation, are inserted.

Page 183, first line below eq. (11), second sentence should be replaced by: A reasonable estimate of the proportionality is $\alpha = -0.55 \pm 0.25$ (see Fig. 2 of this Corrigendum).

Figure 3 of this Corrigendum should replace Fig. 10 in RW on page 184.

Page 184: the discussion in the third paragraph (starting with "Accepting...") about at what freshwater supply the Baltic Sea will turn into a lake

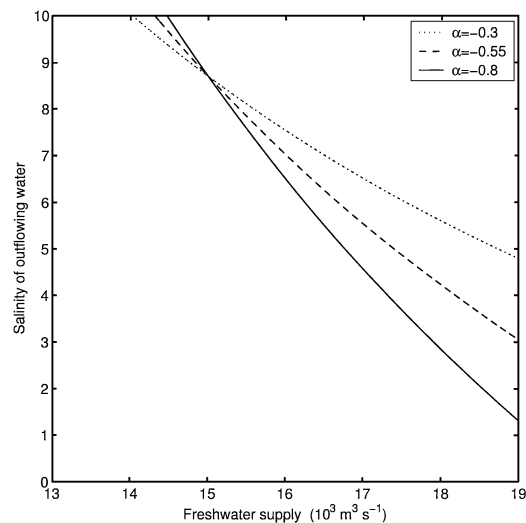


Fig. 3. Modelled steady-state salinity of the outflowing Baltic Sea surface water as a function of the freshwater supply to the Baltic Sea for different values of α [see eq. (11) in RW, and Fig. 2 in the present Corrigendum].

should be omitted. The reason is that the new result indicates that the Baltic Sea salinity will approach zero for a freshwater supply far outside the regime in which the present diagnosis has been performed.

Page 185, first line: 6‰ should be replaced by 8‰. (The following sentences of that paragraph should be omitted.)

Page 185: the paragraph starting at the end of the first column should be omitted.

REFERENCES

- Rodhe, J. and Winsor, P. 2002. On the influence of the freshwater supply on the Baltic Sea mean salinity. *Tellus* **54A**, 175–186.
- Winsor, P., Rodhe, J. and Omstedt, A. 2001. Baltic Sea climate: an analysis of 100 yr of hydrographical data with focus on the freshwater budget. *J. Climate* **15**, 5–15.