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Geoscientific
Model Development
Discussions

Interactive comment on "Historical reconstruction of the Aral Sea shrinking by a full 3-D wetting and drying model ECOSMO" *by* I. Alekseeva and C. Schrum

Anonymous Referee #2

Received and published: 31 October 2008

Review of the manuscript: "Historical reconstruction of the Aral Sea shrinking by a full 3-D wetting and drying model ECOSMO" by I.Alekseeva and C.Schrum

1 General Comments:

The paper presents a 3D hydrodynamic sea-ice model with wetting and drying scheme to simulate the dramatic volume and surface area changes and their consequences for the Aral Sea water budget. The model was successfully used to hind cast observed sea level decrease and surface area changes on a multi-year to decadal time scale.

The paper is well structured, the language is fluent and precise and only a few type

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Interactive Discussion

Discussion Paper

errors are found. Some figures should be improved (see specific comments below).

Scientific methods and mathematical descriptions should be small corrected (see below).

The paper should be accepted after a minor revision.

2 Specific Comments

1) Turbulence is parameterized using a k-e scheme for vertical diffusion. Please, give a reference to the origin (on line 9 page 248).

2) Problem statement it is not finished. Statement of boundary conditions (solid and open) is necessary. (Sect. 2.2)

3) During discussion you use concept as Large Aral and Small Aral. Give the explanatory to the term Small Aral (graphically on Fig. 1?).

4) In the conclusion it is necessary to formulate advantages of use of your model more accurately. It is difficult for making of the text of article.

Answers to specific questions:

1) Does the paper address relevant scientific questions within the scope of GMD? Answer: Yes.

2) Does the paper present novel concepts, ideas, tools, or data? Answer: Yes. As I know, full 3D coupled ocean/atmosphere model is applied for the first time to modeling Aral Sea shrinking.

3) Are substantial conclusions reached? Answer: Yes.

4) Are the scientific methods and assumptions valid and clearly outlined? Answer: In general yes, but authors should advantages of used model are more accurately formulated.

5) Are the results sufficient to support the interpretations and conclusions? Answer: In

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general: Yes.

6) Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes.

7) Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Answer: Yes.

8) Does the title clearly reflect the contents of the paper? Answer: Yes.

9) Does the abstract provide a concise and complete summary? Answer: Yes.

10) Is the overall presentation well structured and clear? Answer: Some improvements may still be required: solid boundary conditions, numerical method. Advantages of use 3D model in comparison with previous models should be more accurately formulated.

11) Is the language fluent and precise? Answer: Some improvements are required.

12) Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Answer: Eqs. 1 and 2 can be removed from the text.

13) Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? Answer: Clarify the solid boundary conditions, numerical method (shortly). The description of the ice results could be shortened.

14) Are the number and quality of references appropriate? Answer: Yes.

15) Is the amount and quality of supplementary material appropriate? Answer: I did not find any supplementary material, and that is appropriate.

3 Technical Corrections

On line 15 page 247: Sect. 1 -> Sect. 2 On line 18 page 247: Sect. 1 -> Sect. 2 On line 10 page 244: hindcast -> hind cast On line 12 page 244: hindcast -> hind cast On line 22 page 247: hindcast -> hind cast On line 26 page 251: … becomes wet it is -> … becomes wet, it is … On page 255 line 12: conservation lows ->

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conservation laws On line 25 page 261: Topex/Poseidon -> TOPEX/Poseidon

Caption of Fig. 5 horizontal axis: Time (month) or months

Interactive comment on Geosci. Model Dev. Discuss., 1, 243, 2008.

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