

Interactive comment on “Integrating field sampling, spatial statistics and remote sensing to map wetland vegetation in the Pantanal, Brazil” by J. Arieira et al.

Anonymous Referee #2

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General comments

The study shows an interesting combination of advanced methods for mapping wetland vegetation which can help to map vegetation over large areas to generate relevant input data for dynamic models, especially when field mapping is restricted by available resources or by areas that are difficult to access. Points of improvement are the structure of the paper, reference to other remote sensing studies and the potential role of the mapping procedure for wetland conservation.

It is a valuable contribution in the field of bio-geosciences and should therefore be considered for publication if a number of changes are applied as specified below.

Specific comments

Structure of the paper

I would recommend a few changes in the structure of the paper, because now data section and analysis section are entangled; I would move the cluster analysis to the section 6, as this is also a part of the mapping and move parts of section 6 to the data section, e.g. which kind of remote sensing are used, description of the DEM etc.

Validation of mapping results

The authors applied 2 different methods to evaluate the quality of the mapping result. Is it important to include both approaches or would 1 be sufficient. And if yes, which one is preferred and why?

Discussion

I would start this section with the research questions and then use the analysis results to answer the research questions. The first sentences of the discussion could be the start of the conclusion section which is currently incorporated in the discussion. In the conclusion section the authors should repeat the main findings and suggestions for future studies.

Cluster analysis is based on 7 classes, however, no information is provided for the choice of 7.

Flooding duration is an important driver of vegetation zonation – would you recommend to include that factor in the prediction?

Remote sensing data where used as input for universal kriging; what is the advantage/disadvantage of this approach to supervised classification?

What is the relation of this particular research to wetland conservation?

Given this approach is used for monitoring, do we need to re-do the field sampling?

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How to go about with only RS images and the DEM?

Technical

6890

Abstract

First sentence needs re-writing, because abstract starts with reference to wetland protection, but the core of the study is the development of a methodology for mapping wetland vegetation and therefore the abstract should start with the main message concerning the larger part of the paper; and furthermore, the first sentence contains 2 aims.

4: change sophisticated to advanced; interpolation and error propagation are also statistical techniques; authors could summarize this as ‘advanced statistical techniques’, in particular. . .

5: change to:to describe spatial vegetation patterns

19: change to:derived from Monte Carlo

25: what are new digital images?

6891

Abstract

1: providing *a* new basis

2: allow – remove ‘ing’

Introduction

5: suggestion: wetlands are vulnerable habitats, threatened by. . .

12: Is it indeed lack of knowledge?

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18: Two aspects (because factors are also used for something else)

6892

Introduction

3: specify the environmental gradients

11: remote sensing *analysis* enables

19: Point data or other field data

6893

Introduction

1: If I understand correctly, emphasis is actually on understanding the complexity, and not only the effect of flooding.

11: What are new data? Probably you mean field-data

10: Aim 1 and 2 could be combined; . . . to identify plant communities by combining field data and remote sensing data using advanced statistical techniques

14: leave out 'on the basis of'

6893

Study area

18: start with the location of the study area

26: trend in precipitation – omit 'the'

27: change topography to 'elevation'

6894

Study area

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5: i.e. (remove’,)

19: change ‘over’ to ‘of’

Outline of the approach

I would rephrase this part: The first step was. . .The second step. . .

24: I would avoid high-resolution field sampling as high-resolution is often used for RS images;

27: Start with: Remote. . . ; omit ‘these’; change ‘are’ to ‘were’ if you want to say what has been done;

6895

Outline of the approach

2: Change ‘these regressions’ into ‘the regression analysis’

3: *was* performed; . . . to combine extracted factor scores and spatially continuous information derived from

Field data

12: We have sampled vegetation data based etc.; there is no need to talk about classification, as this section is about the data; the classification should go into the analysis section;

23: focus on; remove 1 ‘on’

6896

Field data

6: Specify more the sampling scheme

8: 23 trails *each* of 250m

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13: why 50m?

15: what is measurement acquisition?

17: do you mean point quadrat or points along the trail?

19-21: what do you mean with 'intercepted by the plant'?

Section 4.2: I would include a table related to the sampling scheme to get an overview in terms of plot size, frequency etc.

6897

19: How does such a quantification look like?

21: Defining plant communities: where are the clusters coming from and why 7 clusters?

6999

Mapping plant communities

23: would change 'accurate' into 'detailed'

6900

Mapping plant communities

13: It is unclear to me why both PCA factors as well as original bands are used; in my understanding you would derive PCA factors to reduce the number of inputs and to derive meaningful factors with which you would use for further analysis; so why using both? And what is the meaning of each PCA factor?

17: reference to the other study by Ozesmi and Bauer should be made in the literature review or discussion; I don't consider it important here.

19: SRTM data: is it a problem that the DEM measures the top of the trees? – please comment on that in the discussion section

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24: would refer to pixel size when referring to the RS image; how to go about the different cell-sizes? Is it a problem to disaggregate a 90m cell-size to 40x50m? – to be addressed in discussion section.

6901

Mapping plant communities

3-4: What is an interactive raster GIS environment compared to other raster GIS software?

8: What are the DEM-derived variables? And why Pearson? Is the relation linear?

Section 6.3: I would appreciate a table with the RS variables and DEM variables

18: Was stepwise regression used? What is a best-subset regression? Does the 'best' exist?

6903

Mapping plant communities

24: change accurate into 'detailed'

6904

Mapping plant communities

17: would change rapidly into clearly

24: What is a most accurate map? What do you use as a reference?

6905

Mapping plant communities

2: points are also spatial

7: which scores – specify!

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C3661

6906

Mapping plant communities

9: change 'make' into 'making'

Figures

6908

Flood-duration

6: it seems that there is also a more detailed DEM; why did the authors not use that particular DEM?

6909

Discussion

14: I would start with the main aims and frame the discussion around the 4 aims; The first sentence of discussion could be moved to the conclusion section which is currently part of the discussion.

6910

Discussion

8: sentence unclear to me

19: did all these authors use RS analysis in their studies?

6911

Discussion

14: change to 'for improvement in mapping'

17: what is a better sample design?

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6918

Use Wesseling et al , 1996 instead of conference paper

6923

Table 3: What is canopy topography? Is it the elevation that is measured with the SRTM DEM? If yes, specify that in the data section. What is **P*?

6925

Legend of DEM – is it important to choose decimals when making elevation classes?

6926

Figure 2: Chart of procedure: Would change ‘transformation’ into ‘processing’; specify type of clustering; change image derived attributes into ‘continuous field variables’; change accuracy of Mapping into validation. I guess that comparison is the correlation analysis; then it could also named correlation.

6927

Figure 3: the line 250 does not make sense, because the length of the whole trail is 250 m and not the width of starting point compared to end point.

Interactive comment on Biogeosciences Discuss., 7, 6889, 2010.

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