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Corrigendum: Seabed classification of multibeam echosounder data into bedrock/non-bedrock using deep learning

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A Corrigendum on
Seabed classification of multibeam echosounder data into bedrock/non-bedrock using deep learning

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In the published article, there were minor inaccuracies, specifically concerning the metrics values for multiple-input models (Table 2) and misclassification values in Table 3. The corrections also extend to the corresponding confusion matrices in the **Supplementary Material**.

In Table 2, the sub-headers PAcc and UAcc were interchanged. In addition, the metrics for the multiple-input models have been re-evaluated to reflect minor miscalculations in the code. The corrected Table 2 and its caption appear below.

In Table 3, there was a slight miscalculation of some of the statistical values in the columns under "Fraction of original class in the bedrock prediction (%)", and a transcription error in the value for the original class "Sand, gravel and cobbles" for the model M_B. The corrected Table 3 and its caption appear below.

In **3 Results**, paragraph 1, it was stated: "The results for the multiple-input models confirmed the higher predictive power of the depth and slope over backscatter, as all the models incorporating backscatter data (M_{BD}, M_{BH} and M_{BS}) consistently showed lower performance metrics. Noticeably, while M_{DS} displayed the highest metrics among the multiple-input models, it did not outperform the single-input models M_D and M_S." The corrected paragraph is as follows:

"The results for the multiple-input models confirmed the higher predictive power of the depth and slope over backscatter, as all the multiple-input models incorporating backscatter data (M_{BD}, M_{BH} and M_{BS}) consistently showed lower performance

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TABLE 2 Overview of the metrics calculated for both the single-layer and two-layers models.

Single-layer models							
Model name	DStest	UAcc		PAcc		Acc	Kappa
		Non-bedrock	Bedrock	Non-bedrock	Bedrock		
Backscatter (M_B)	0.69	0.86	0.63	0.77	0.76	0.77	0.51
Depth (M_D)	0.79	0.93	0.72	0.83	0.88	0.84	0.67
Hillshade (M_H)	0.76	0.93	0.66	0.76	0.89	0.81	0.60
Slope (M_S)	0.80	0.92	0.75	0.85	0.85	0.85	0.68
Two-layers models							
Backscatter and Depth (M_{BD})	0.71	0.90	0.62	0.74	0.83	0.77	0.54
Backscatter and Hillshade (M_{BH})	0.74	0.90	0.66	0.78	0.84	0.80	0.58
Backscatter and Slope (M_{BS})	0.78	0.92	0.72	0.83	0.86	0.84	0.66
Depth and Hillshade (M_{DH})	0.74	0.93	0.64	0.74	0.89	0.79	0.58
Depth and Slope (M_{DS})	0.77	0.89	0.75	0.86	0.80	0.84	0.66
Hillshade and Slope (M_{HS})	0.78	0.91	0.72	0.83	0.85	0.84	0.66

metrics than the corresponding single-input models without backscatter data (respectively, M_D, M_H, and M_S). Noticeably, no multiple-input models outperformed the best single-input models."

In **3 Results**, paragraph 3, it was stated: "This observation is confirmed by the results listed in Table 2 where the UAcc values for the bedrock class for all the models are higher than the corresponding PAcc ones". To address the mislabeling of "PAcc" and "UAcc", the sentence has been corrected as follows:

"This observation is confirmed by the results listed in Table 2 where the PAcc values for the bedrock class for all the models are higher than the corresponding UAcc ones."

In **3 Results**, paragraph 4, it was stated: "While the models generally over-predict the bedrock class, as seen from the higher UAcc values compared to the corresponding PAcc values (Table 2) and from **Figure 9**, instances of under-prediction are also evident." To address the mislabeling of "PAcc" and "UAcc", the sentence has been corrected as follows:

"While the models generally over-predict the bedrock class, as seen from the higher PAcc values compared to the corresponding UAcc values (Table 2) and from **Figure 9**, instances of under-prediction are also evident."

In **3 Results**, paragraph 5, it was stated: 'As an example of the table interpretation, for the original class "exposed bedrock" and for the model M_D, the 19.92% of the totality of pixels predicted as bedrock, corresponds to the original class "exposed bedrock".' Modifying a percentage value as per Table 3, the sentence has been corrected as follows:

'As an example of the table interpretation, for the original class "exposed bedrock" and for the model M_D, 19.95% of the totality of pixels predicted as bedrock, corresponds to the original class "exposed bedrock".'

In **4 Discussion**, paragraph 3, it was stated: "M_{BD}, M_{BH} and M_{BS} showed comparable performance to one another but a lower performance compared to the single-layer depth models (Table 2)." The sentence has been corrected as follows:

"M_{BD}, M_{BH} and M_{BS} showed a varied range of performance, but it was in each case lower compared to the corresponding single-layer model without the backscatter layer (Table 2)."

To reflect the updated metric values for the multiple-input models, **Supplementary Figures S5–S10** have been updated.

The authors apologize for these errors and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.

Publisher's note

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TABLE 3 The table analyzes the over-prediction of the bedrock class resulting in pixels predicted as bedrock even if belonging to a different original sediment class. The over-prediction of the bedrock was quantified by dividing the number of pixels of each original class predicted as bedrock, by the total number of pixels predicted as bedrock. These results are displayed respectively for the backscatter, depth, slope and the backscatter and depth models in the column "Fraction of original class in the bedrock prediction (%)". A column showing the fraction of original sediment classes in the test dataset (%) has also been added. To be noted that the sum of percentages in this column adds up to 80.37%, the remaining 19.63% belongs the background class, not included in the calculation.

Converted classes	Original classes	Fraction of original class in the test dataset (%)	Fraction of original class in the bedrock prediction (%)			
			M_B	M_D	M_S	M_{BS}
Bedrock	Thin or discontinuous sediment cover on bedrock	20.27	45.13	52.85	53.91	44.76
	Exposed bedrock	7.03	18.62	19.95	21.35	18.05
Non-bedrock	Sand, gravel and cobbles	6.76	8.62	3.90	3.68	7.95
	Gravel, cobbles and boulders	2.18	0.43	0.21	0.17	0.84
	Mud and sand with gravel, cobbles and boulders	2.32	1.09	0.98	0.44	1.14
	Anthropogenic material	0	0	0	0	0
	Cobbles and boulders	6.66	1.15	1.00	0.55	2.82
	Mud/sand and cobbles/boulders	0.27	0.13	0.08	0.01	0.11
	Sand and boulders	0	0	0	0	0
	Cobbles/boulders covered by mud/sand	1.20	1.31	1.53	1.12	1.27
	Sand	3.05	0.24	0.07	0.07	0.57
	Mud	0.51	0.09	0	0.01	0
	Sandy mud	8.90	0.98	0.77	0.72	0.78
	Muddy sand	4.13	1.43	1.09	0.91	1.43
	Gravelly sandy mud	1.05	0.37	0.25	0.40	0.33
	Gravelly muddy sand	1.09	0.89	0.50	0.43	0.76
	Gravelly mud	0	0	0	0	0
	Organic mud	0	0	0	0	0
	Gravelly Sand	1.26	0.84	0.53	0.43	0.89
	Gravel and cobbles	2.01	0.49	0.15	0.17	0.92
	Sand, gravel, cobbles and boulders	11.66	18.14	16.10	15.58	17.31
	Sandy gravel	0.05	0.04	0.04	0.05	0.06
	Gravel	0	0	0	0	0
	Muddy gravel	0	0	0	0	0
	Muddy sandy gravel	0	0	0	0	0