Addendum to Van der A et al. (2013), Coast.Eng., 76
Dominic A. van der A
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In Van der A et al. (2013) the sheet flow layer thickness $\delta_{s,i}$ (with $i = c$ for crest, and $i = t$ for trough) for graded sand conditions is calculated according

$$\frac{\delta_{si}}{d_{50}} = \begin{cases} 35\hat{\theta}_i & \text{if} \quad d_{50} \leq 0.15\,\text{mm} \\ \left[35 - \dfrac{22(d_{50} - 0.15)}{(0.20 - 0.15)}\right]\hat{\theta}_i & \text{if} \quad 0.15\,\text{mm} < d_{50} < 0.21\,\text{mm} \\ 13\hat{\theta}_i & \text{if} \quad d_{50} \geq 0.21\,\text{mm} \end{cases} \tag{1}$$

where the maximum Shields parameter $\hat{\theta}_\text{i}$ is (Eq. C.2)

$$\hat{\theta}_i = \frac{\frac{1}{2} f_{\text{w}\delta_i} (\hat{u}_i)^2}{(s-1) g d_{50}} \tag{2}$$

Thus Eq. 1 is based on the overall d_{50} of the sand mixture, and moreover the fine sand constant in Eq. 1 takes original value of 35 following Dohmen-Janssen (1999) since no roughness correction (i.e. μ=1 for all d_50) was applied for fine graded sands as explained in Van der A et al. (2013). However, instead of using the maximum Shields according the Eq. 2 the Matlab code for graded sands incorrectly used the *representative* Shields parameter $|\theta_i|$ to calculate the sheet flow layer thickness (Eq. 17)

$$|\theta_i| = \frac{\frac{1}{2} f_{\text{w}\delta_i} \left(\frac{1}{2}\sqrt{2}\hat{u}_i\right)^2}{(s-1) g d_{50}} \tag{3}$$

Adopting the representative Shields parameter in Eq. 1 therefore leads to a sheet flow layer thickness which is a factor 2 smaller compared to the sheet flow layer thickness based on the maximum Shields parameter (Eq. 2).

The following pages show the original graded sand results of Van der A et al. (2013), thus based on Eq. 1 and 3, and the adjusted graded sand results, whereby the graded sand sheet flow layer thickness is based on the maximum Shields parameter (Eq. 2). The figures illustrate that the predictions are generally closer to the 1:1 line as a result of the adjustment, which is also reflected in the improved skill score (BSS) and improved bias. However, for one (fine sand) condition the direction is now incorrectly predicted which consequently leads to a reduction in fac5% and r^2. When considering the score for the entire database the scoring results are only marginally affected, which is partially due to the small number of graded sand conditions.

Since the overall results nevertheless improve because of the adjustments (skill and bias improve, fac5% only reduces), and to be consistent with the uniform sand calculations, the sheet flow layer thickness for graded sands (Eq. 1) should be based on the maximum Shields parameter (Eq. 2). While obviously not incorporated in Van der A et al. (2013) this adjustment is henceforth incorporated in the MATLAB code (v2.8) of the SANTOSS transport formula.

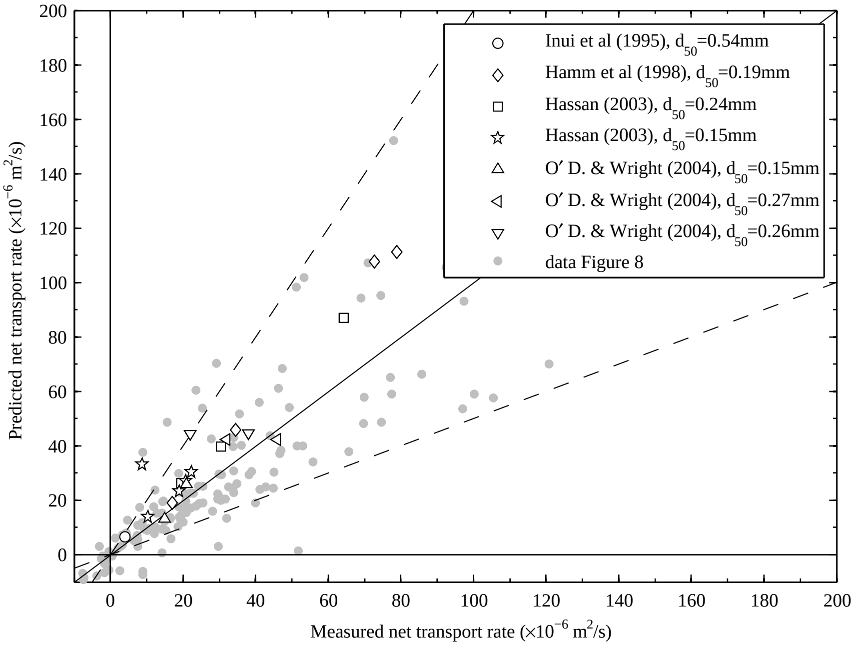

Figure 9 of Van der A et al. (2013).

Scoring results according Van der A et al. (2013) Table 2.

Data (sub)set	N	BSS	$bias$	r^2	$fac2$ (%)	$fac5$ (%)
Velocity-skewed sheet flow $d_{50} \geq 0.20$mm	32	0.91	-8	0.78	97	100
Acceleration-skewed sheet flow $d_{50} \geq 0.20$mm	32	0.92	2	0.87	84	97
Oscillatory sheet flow $d_{50} < 0.20$mm	29	0.73	-8	0.80	86	93
Oscillatory flow over rippled beds	53	0.72	4	0.65	62	89
Oscillatory flow with collinear current	50	0.72	61	0.84	70	86
Graded sands	19	0.83	45	0.91	89	100
Progressive surface waves	11	0.57	27	-1.05	82	100
Regular flows	203	0.76	18	0.76	81	94
Irregular flows	23	0.54	18	0.95	57	87
Sheet flow	173	0.76	22	0.73	83	94
Ripples	53	0.72	4	0.65	62	89
Fine sand ($d_{50} < 0.20$mm)	64	0.70	-16	0.72	77	89
Coarse sand ($d_{50} \geq 0.20$mm)	162	0.79	31	0.85	79	94
All	226	0.76	18	0.77	78	93
All with ripple predictor	226	0.76	10	0.76	69	86

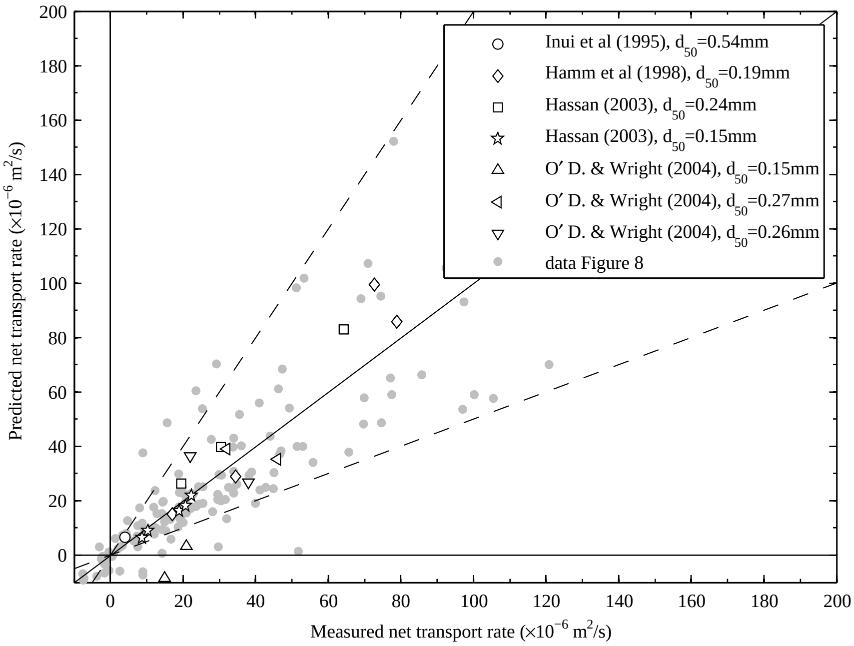

Figure 9 of Van der A et al. (2013) adjusted - i.e. δ_{si} based on $\hat{\theta}_i$ instead of $\hat{\theta}_{i,\mathrm{r}}$

Scoring results according Van der A et al. (2013) Table 2 adjusted.

Data (sub)set	N	BSS	$bias$	r^2	$fac2$ (%)	$fac5$ (%)
Velocity-skewed sheet flow $d_{50} \geq 0.20$mm	32	0.91	-8	0.78	97	100
Acceleration-skewed sheet flow $d_{50} \geq 0.20$mm	32	0.92	2	0.87	84	97
Oscillatory sheet flow $d_{50} < 0.20$mm	29	0.73	-8	0.80	86	93
Oscillatory flow over rippled beds	53	0.72	4	0.65	62	89
Oscillatory flow with collinear current	50	0.72	61	0.84	70	86
Graded sands	19	0.90	-5	0.77	89	89
Progressive surface waves	11	0.57	27	-1.05	82	100
Regular flows	203	0.76	13	0.76	81	93
Irregular flows	23	0.54	18	0.95	57	87
Sheet flow	173	0.77	16	0.73	83	93
Ripples	53	0.72	4	0.65	62	89
Fine sand ($d_{50} < 0.20$mm)	64	0.70	-16	0.72	77	89
Coarse sand ($d_{50} \geq 0.20$mm)	162	0.80	25	0.84	79	93
All	226	0.77	13	0.77	78	92
All with ripple predictor	226	0.77	6	0.76	69	85

References

Dohmen-Janssen, C. M. (1999). *Grain size influence on sediment transport in oscillatory sheet flow*. PhD thesis, Delft University of Technology, The Netherlands.

Van der A, D. A., Ribberink, J. S., van der Werf, J. J., O'Donoghue, T., Buijsrogge, R. H., and Kranenburg, W. M. (2013). Practical sand transport formula for non-breaking waves and currents. *Coastal Engineering*, 76(0):26–42.