

# GLY 4734/6932 - Coastal Morphology and Processes

## Beach Profiles / The Bruun Rule

Group 1

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### Help sheet for beach profiles graphics

- **Equilibrium profiles**

The equilibrium beach profile theory used in this model is based on a balance between destructive and constructive forces acting on the shoreface. The profiles are given by:

$$h = A(x)^{(2/3)}$$

Where  $h$  is depth,  $x$  is cross-shore position, and  $A$  is an empirical coefficient which changes with grain size.

- **The Bruun Rule**

The Bruun Rule is based on equilibrium profile theory, and states that volume loss from shoreline recession due to sea level rise is matched by deposition on the lower shoreface. This balance is written as:  $R = SL/h$

$R$ : horizontal shoreline retreat

$S$ : sea level rise

$L$ : horizontal distance to the depth of closure

$h$ : depth of closure

### References

1. Ashton, A., Murray, A. B., & Arnould, O. (2001). Formation of coastline features by large-scale instabilities induced by high-angle waves. *Nature*, 414(6861), 296.
2. Komar, P. D. (1971), The mechanics of sand transport on beaches, *J. Geophys. Res.*, 76, 7137-21.



