Geomorphic Frameworks

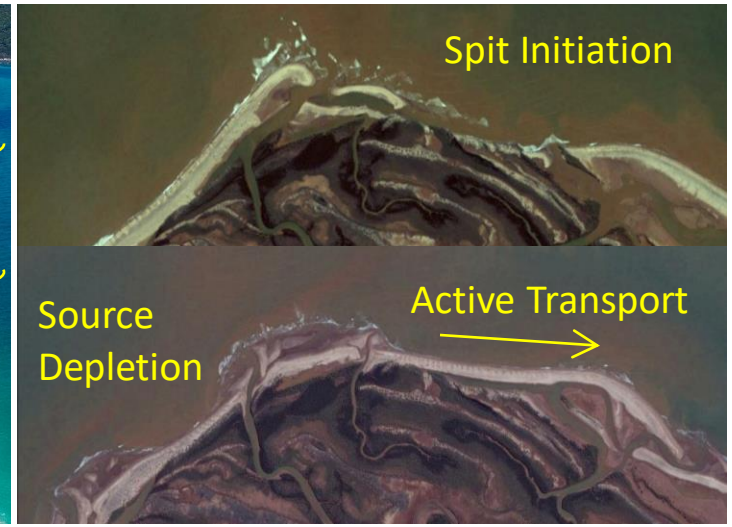
Geomorphic frameworks relate the position and movement of sediments to the shape of features the sediments comprise. This is applicable at many scales, e.g. influence of beach slope on response to storm waves; or plan-form control by rock headlands affecting where river sediments end up.

Many coastal engineering tools use conceptual models supported by geomorphic frameworks. This simplifies relationships between coastal forcing and responses. However, used as base assumptions, the underpinning science can be obscured, limiting understanding or biasing interpretation of coastal change.

Hence, understanding the geomorphic frameworks that underlie coastal engineering tools is key to using them effectively.

Some of the attributes of geomorphic frameworks include:

- Conservation of sediment volume;
- State (form) dependence of transport;
- Aggregated behaviour.



Over coastal engineering time scales, rates of sediment production are small. This allows use of a volume balance over selected time or space scales. The domain (e.g. model area) or direction (e.g. profile modelling) where the balance applies affects estimates of coastal change.

Sediment exchange between different parts of a landform (e.g. lower/upper beach) or between adjacent landforms (e.g. beach-dune) is rarely a one-way process. Consequently, model bias can be introduced by the presence or absence of connected landforms.

Landforms can variously provide sediment storage, or act as a pathway for sediment transport. Storage and transfer are commonly related, as illustrated by ephemeral spits, where transport is directly determined by updrift storage.

Sediment transport is made up of many movements, making any measure of transport time dependent. This is important for the concepts of littoral transport and sediment budgets, which are highly scale-dependent.

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