



Beach Conservation

Common misconceptions about beaches

Introduction

Interactive behaviour between the lake and beaches is a complex process which is often poorly understood. One of the Coastal Centres roles is to provide expert advice to local governments and the general public on the management of coastal areas. However, people sometimes have misconceptions about beach behaviour and coastal processes, and sometimes these can stand in the way of implementing appropriate management strategies, advancing concepts which are not soundly based. Beaches are described as being dynamic for a reason. They change constantly and need to be able to make these changes in order to maintain their equilibrium. When their balance has been disrupted, challenges occur. The purpose of this article is to discuss some of the common misconceptions surrounding beach processes.

Misconception #1 Beach erosion is a problem and must be prevented.

Facts

Erosion is an integral part of natural coastal processes which have formed beaches and which

maintain them in a condition we can all enjoy. Beaches are composed of individual grains of sand which move easily with the forces of the waves, currents and the wind. These forces are constantly changing. Nature has established a balance in which beaches preserve themselves but are never static. The effects of erosion during storms are balanced by subsequent accretion and dune building in calmer conditions. This situation can be compared to the similar erosion and deposition of material within creeks and streams. The balancing of the forces acting within the river and the corresponding reaction to these forces concerning sediment load is very similar to the dynamic beach along coastlines. The beach acts as a buffer along this land / water boundary.

Beaches are most effectively protected if we accept the natural processes of erosion and accretion and do not disrupt the balance in our use of the coastal zone. Many people mistakenly perceive the redistribution of sand from the visible part of a beach to nearshore areas (offshore sandbar) during heavy wave attack as a permanent loss of sand from the beach. However, this sand will always be

retained within the active beach and nearshore zones, readily available to contribute to replenishment of the eroded beach, which will occur naturally during the ensuing calm periods.

Misconception #2

A good cover of trees and grasses on the dunes will effectively prevent beach erosion.

Facts

A good cover of vegetation on the frontal dunes landward of a sandy beach traps the sand blown from the beach by the wind and causes the dune to grow and advance towards the lake. This process, when accompanied by progressive growth of dune vegetation, can result in large volumes of sand being stored in the frontal dunes. During periods of heavy wave action, when sand is moved from the beach to offshore areas, the beach moves progressively landward. Eventually, this landward movement of the beach reaches the frontal dune.

Sand is then supplied to the beach by progressive slumping of the frontal dunes, slowing down the

rate at which the beach moves landward. The larger the frontal dune, the greater its ability to continue to supply replacement sand to the beach during periods of heavy wave attack. Destroying the vegetation in sand dunes allows the wind to blow the dunes away, thus increasing the vulnerability of the coast to erosion. While a good vegetation cover helps increase the volume of sand in the frontal dune and prevents wind erosion, the presence of the vegetation itself provides little resistance to wave erosion. The roots of plants and trees have virtually no capacity to reduce the loss of sand from the beach caused by wave attack. The role of dune vegetation is restricted to building the frontal dunes and preventing sand loss from the beach system by wind erosion.

Therefore, while a good cover of vegetation on the dunes is an important aspect of the coastal environment, we must recognize the limitations of vegetation by itself as a means of erosion prevention. Vegetation by itself does little to prevent erosion by waves. A lack of vegetation caused by impacts associated with pedestrian foot traffic or vehicles, can result in erosion of the exposed dune from wind effects.



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Misconception #3

Sea walls built along the foreshore prevent beach erosion.

Facts

A natural beach may move landward or lakeward under the influence of wave action and lake currents.

This movement is the result of sand being moved from the beach to offshore areas during periods of heavy wave action and subsequently being returned in calm periods. A sea wall built along a beach isolates the sand behind the wall from the active beach system. This sand is excluded from the normal onshore and offshore movement characteristic of natural beach behaviour. As a result, the beach lakeward of the wall can become unusable for substantial periods after heavy wave action. Sea walls really act only to protect landward property. They offer no protection to beaches against erosion. The further lakeward a wall is constructed, the greater the quantity of sand isolated, and the less likely it is that a usable beach will be maintained in front.

On persistently eroding beaches, the receding beachline will place a sea wall progressively further lakeward on the beach profile over time, until no beach exists in front of the wall. Clearly, the establishment of fixed sea wall alignments on persistently eroding sections of beach will eventually lead to the loss of the beach as a useful recreational amenity. Eventually, the wall itself will be undermined and fail due to the dynamic nature of the environment.

Conversely, if a beach is allowed to erode naturally, unimpeded by the presence of a sea wall, a usable beach will always be available.

Misconception #4

Recreational use and development of the sand dunes pose no threat to the beach.

Facts

The frontal dunes and the upper part of the beach represent a vital reserve of sand. They provide a ready sand supply to the beach during erosion phases when sand is being moved off the beach by wave action.



Seawall built in this dune area isolates the sand behind the wall from the active beach. In this example, the owner has not only built a seawall, but has built a cottage directly on the dune.



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***Providing Leadership in Coastal
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The community often places great value and importance on facilities and structures located on or close to the beach, particularly in urban areas. Any threat of erosion to such facilities or lands usually leads to community pressures for the construction of a protective barrier such as a sea wall. This can then lead to the loss or severe depletion of the adjacent beach through isolation of the dune sand from the active beach system, as discussed earlier.

Consequently, any structures or recreational areas likely to require protection from erosion should be kept as far landward as possible.

Conclusion

One of the Coastal Centres' roles is to provide advice to the authorities responsible for the management and maintenance of Lake Huron's beaches. Misconceptions relating to beach processes must be eliminated from coastal engineering practice and coastal management if Lake Huron's beaches are to be properly protected. All persons involved in coastal management must recognize the need for sound technical advice as the basis for successful coastal management.

Reference: Carter, T., July 1999, *Common Misconceptions About Beaches*. in: Beach Conservation, Issue No. 63 May 1986, Beach Protection Authority of Queensland, Australia.



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