# Geography Unit 1 - Water Cheat Sheet

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## Processes of Erosion

**Corrasion**

Fine material rubs against the river bank, causing sandpaper-like erosion

**Attrition**

The colliding of two pieces of river material, causing them to break into smaller pieces

**Solution**

The process of rocks forming the river bank are dissolved (or corroded) by acids in the water

**Hydraulic action**

The sheer force of water hitting the river bank

## Meanders

Water in the meander is 'thrown' to the outside of the river bend, where there is the fastest current and the water has the highest energy to erode the channel.

The **outside** of the river is undercut to leave an **overhang**, which will eventually collapse and leave a **bluff**.

The **inside** of the river receives a lot more deposition due to lower energy water. This creates a **slip-off slope**.

## Deltas

Deltas are formed by deposition from a river at an **estuary** where water moves very slowly.

These provide very good soil for farming, although they are prone to flooding due to the flattening of the land.

## Hard Engineering of Flood Prevention

**Dams and Reservoirs**

These are very effective methods of flood management, and can be used to generate **HEP**.
However, they can be very expensive and make farmland less fertile due to reduced deposition.

**Man-made Levees**

They are quite cheap, although they can cause flooding if they break.

**Channel Straightening**

Water moves away more quickly because it doesnt travel as far.
However, flooding may happen downstream if the flood water is carried there faster.

## Case Study - Niagara Falls

Niagara Falls is a honeypot site, where over 6 million tourists per year visit. Because of this, the area has been filled with restaurants and hotels to cater to these tourists.

## Processes of Transportation

**Traction**

Large rocks and boulders are rolled along the bottom of the river

**Saltation**

Small stones are bounced along the bottom of the river bed in a "leap-frogging" motion

**Suspension**

Very fine, dissolved material which is light enough to be carried by the river.

## Case Study - Boscastle Flooding

**Date**

August 16th, 2004

**Location**

The west coast of Cornwall, near the River Valency and the River Jordan.

**Causes of Flooding**

- Very heavy rainfall throughout the summer, with nearly 10cm of rainfall within one hour.
- Impermeable rocks were unable to absorb the water appropriately.
- The narrow valleys nearby the River Valency and the River Jordan acted as 'funnels' to increase water speed.

**Effects of Flooding - Short Term**

- Roads were blocked, making it difficult for emergency services
- People were left homeless, with vehicles being swept away by the water.
- People were trapped in buildings as water level rose.

**Effects of Flooding - Long Term**

- The ground floors of many buildings were destroyed
- Many people claimed insurance, so premiums increased
- Reduces tourist revenue

## Flood Plains

Flood plains are flat areas of land which are resultant of eroded **interlocking spurs**, leaving only level ground.

As the river leaves its bank when it floods, it deposits the heaviest material closest to the channel forming **levees**. These are "barriers" between the river and the flood plain.

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## Flood Plains (cont)

Deposition from river flooding over the flood plain is useful, as it results in very rich **fertile soil** for farming and building.

## Formation of a V-shaped Valley

The primary use for a river's energy is to transport material away from the river bed. This results in the river deepening rapidly, known as **vertical erosion**.

Additionally, due to weathering, the sides of the river are broken down and are added to the load of the river where it is consequently carried away.

This creates a "V-shaped" area around the river.

## Waterfalls

Waterfalls form when there is a sudden interruption in the course of a river. This may be because of, for example,

- **Erosion by ice**
- **Changes in sea level**
- **Tectonic movements**

Additionall, waterfalls can form from a change in the softness/hardness of the rock. Soft rock will erode downwards faster, causing a steep drop from areas of hard rock to areas of soft rock. The hard rock is **undercut** and will collapse to form a **plunge pool** at the base of the waterfall.

## Ox-bow Lakes

Ox-bow lakes are the result of a sharp bend in a **meander**.

The bend becomes increasingly sharp until the river breaks through the land that divides the two parts of the river.

Eventually, deposition will "seal off" an ox-bow shaped volume of water near the now straightened river.

## Soft Engineering of Flood Prevention

**Flood warnings**

> This reduces the impact of flooding, although they do not stop floods from happening and rely on people being able to receive the warning(ie, not in LEDCs)

**Preparation**

> Buildings are less damaged and people know what to do when a flood happens. However, it can give people a false sense of security as well as being expensive.

**Flood plain zoning**

> This limits the expansion of an urban area in order to not create impermeable surfaces or build in areas affected by flooding. It is of no help to existing areas.



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