

## Unit 6 Weather Hazards

### 6.1 How do storms develop?

You need to know about depressions (which effect this country) and tropical storms (which don't)

**Depressions** are low pressure systems formed when cold air meets warm air. The boundary of the two types of air is called a **front**. At this point the warm air rises and cools, causing **condensation** and water vapour forms droplets. These form clouds and it rains. Depressions bring changeable weather - often rain and strong winds.

**Tropical storms** are extreme low pressure systems. They form near (**not at**) the equator at certain times of the year. They bring very strong winds (75 mph+), torrential rainfall, thunder storms, high waves and flooding. They are called hurricanes, cyclones or typhoons in different parts of the world. Although tropical storms have very strong winds blowing around them, they are actually very slow moving - they can change direction quite quickly though so this makes them unpredictable. To form, tropical storms need:

- large amount of warm water (over 27°C) - this provides the energy. When the storm reaches land the energy source is cut so they rapidly drop in wind speed
- deep water depth of 70m plus
- hot, humid climate with winds blowing in the same direction
- just north or south of the equator - so that the spin of the earth provides a spin for the storm
- they tend to form during the late summer/autumn periods

You can find out more about tropical storms at:

[http://news.bbc.co.uk/1/hi/in\\_depth/americas/2004/hurricane\\_season/default.stm](http://news.bbc.co.uk/1/hi/in_depth/americas/2004/hurricane_season/default.stm)

You need at least one detailed case study - both Hurricane Isabel and Hurricane Ivan hit the USA recently so would be good choices.

### 6.2 What problems does flooding cause?

You can talk about two types of flooding:

- river flooding - usually occurs because of heavy rain
- coastal flooding - usually because of storms and heavy rain (for example, when a tropical storm reaches land)

Most floods are caused by a combination of natural (physical) factors and human changes to the landscape.

#### **Natural factors:**

- high rainfall leading to the soil being saturated with water, causing overland flow which reaches the river quickly, causing the river level to rise more quickly so it overflows - causing a flood;
- snow melting
- heavy rain after hot temperatures have baked the soil hard - making it impermeable
- low pressure storms causing high waves in coastal areas
- impermeable soils and rocks (e.g. clay) which don't let water seep in

#### **Landscape changes:**

- deforestation - or the removal of any vegetation which slows up the flow of water to rivers
- urbanisation - soils are replaced by impermeable concrete and sewers which move the water quickly to rivers
- building on flood plains - increases the risk to people of flooding
- global warming - higher sea levels will increase the chance of coastal floods and the number of storms

### 6.3 How can areas be protected against storms and floods?

- prediction - using satellites and radar to forecast storms and heavy rain
- evacuation and flood/storm shelters
- building design and location - to resist storms, on stilts to limit the effect of floods and away from risk areas
- emergency measures - sand bags or hurricane shutters
- dams and river management - reduce the flow of water in key locations (e.g. straightening rivers, using embankments or levées)
- planting trees - is a cheap way of reducing the risk of floods as it slows the movement of water and holds the soil together
- providing emergency aid after the event - having good emergency services helps

#### **Primary effects:**

- loss of life
- injury
- loss of land/buildings/crops
- industry/communications destroyed

#### **Secondary effects:**

- loss of shelter
- limited food supply - starvation
- contaminated water - disease
- loss of income