

Tropical Storm Formation

Learning Objective:

- **Assess** the distribution of tropical storms



Learning Outcomes:

- **Define** a tropical storm
- **Explain** their formation
- **Assess** the impact of climate change on frequency, distribution and intensity



Weather maps

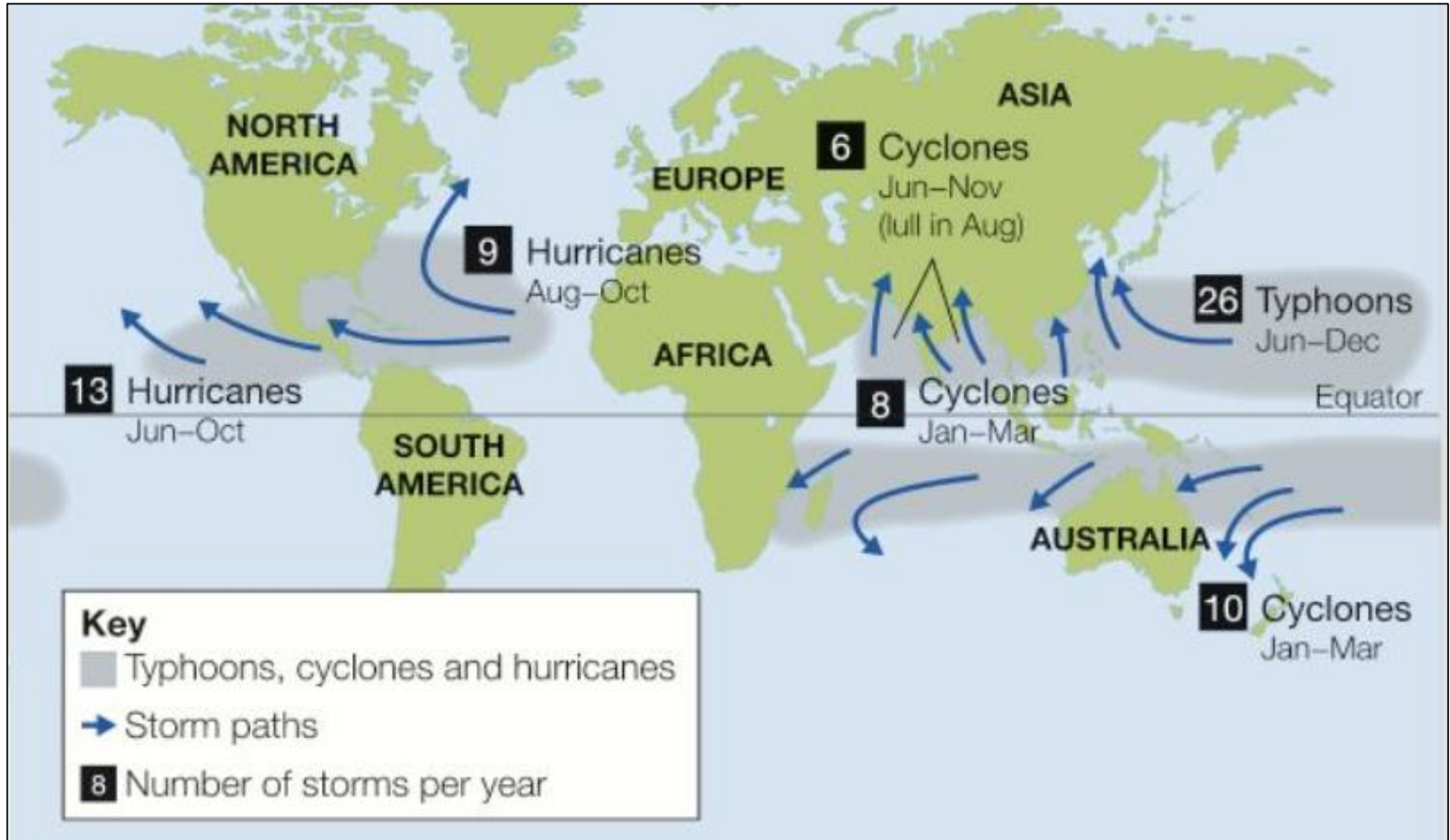


A satellite image of a tropical storm, showing a well-defined eye and spiral cloud bands over a dark ocean surface. The storm is the central focus of the image.

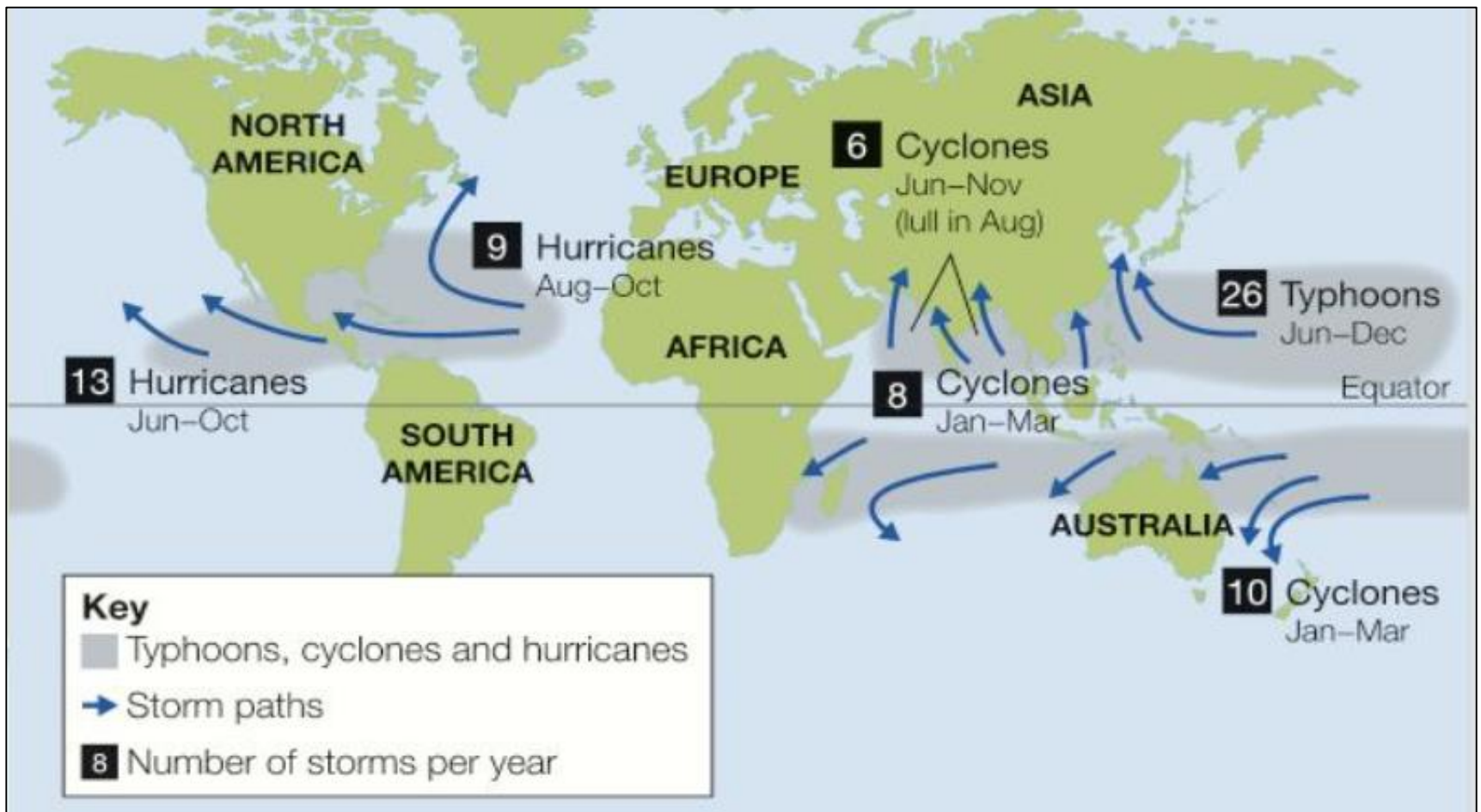
- **A tropical storm is ...**

- **What names are they known as?**
- **What do they do?**

Location of tropical storms

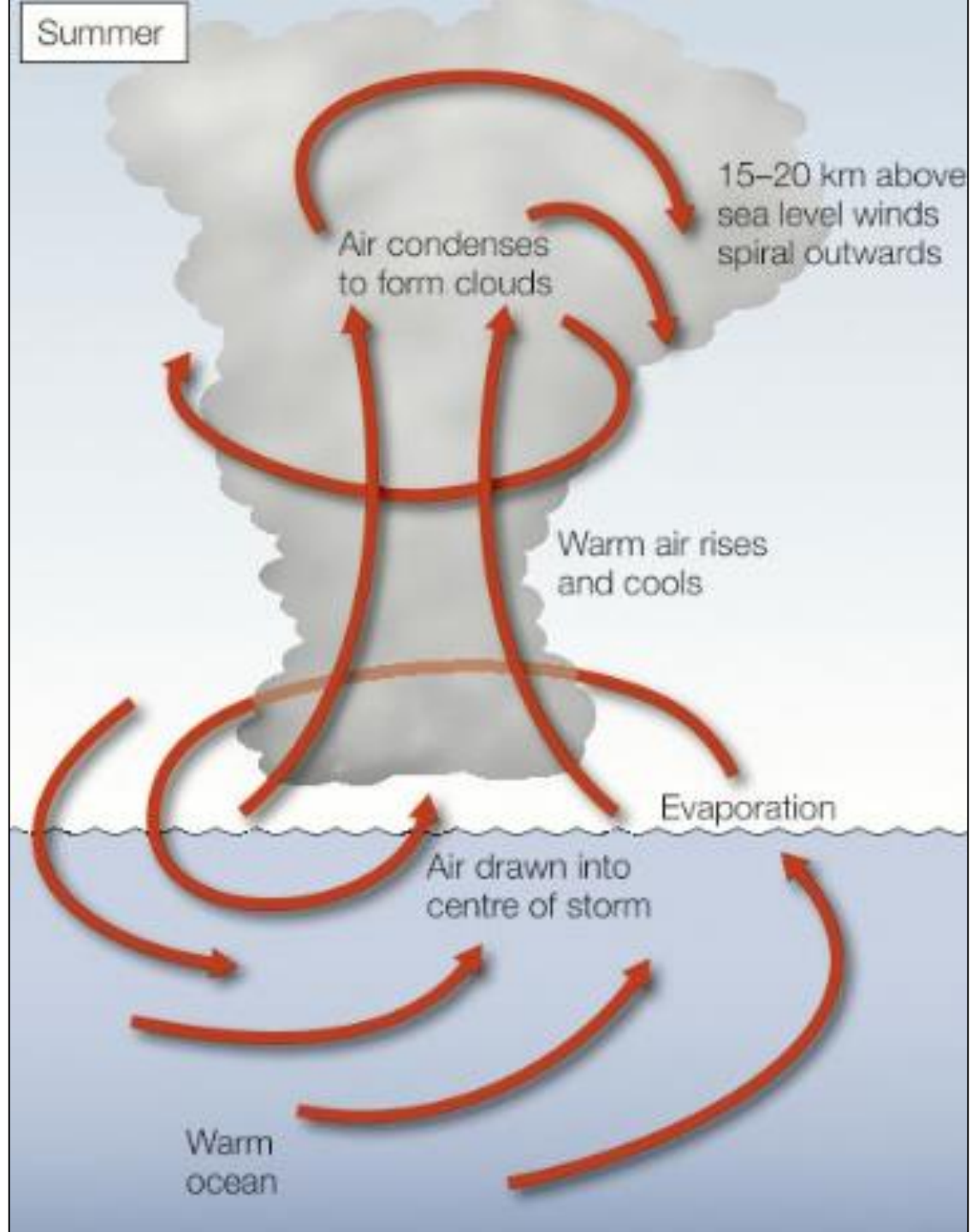


- By **what name** is a tropical storm known as in each of the following areas: N Indian Ocean, NW Pacific Ocean, N Atlantic Ocean, SW Pacific Ocean?



- **Describe** the global **distribution** of tropical storms (3)
- **Specific locations:** They form between the equator and tropic of Cancer/Capricorn (1). They form to the north and south of the equator (1) Could say to the east of Asia/North of Australia (1) The worst effected area is the NW Pacific with 26 each year (1) They are not found on the equator itself (1)

Summer



[Coriolis clip](#)

As the hurricane moves across the ocean, it picks up more moisture and increases its speed.

The warm air rises faster and faster, this encourages more warm air to be sucked up into the storm, but it also sucks cooler drier air down.

Trade winds cause the storm to rotate in an anti-clockwise direction.

Warm air from thunderstorms and from the surface of the ocean, combine and begin to rise causing low pressure.

The outer edge of the Hurricane is a spiralling vortex. It has high rainfall and high winds.

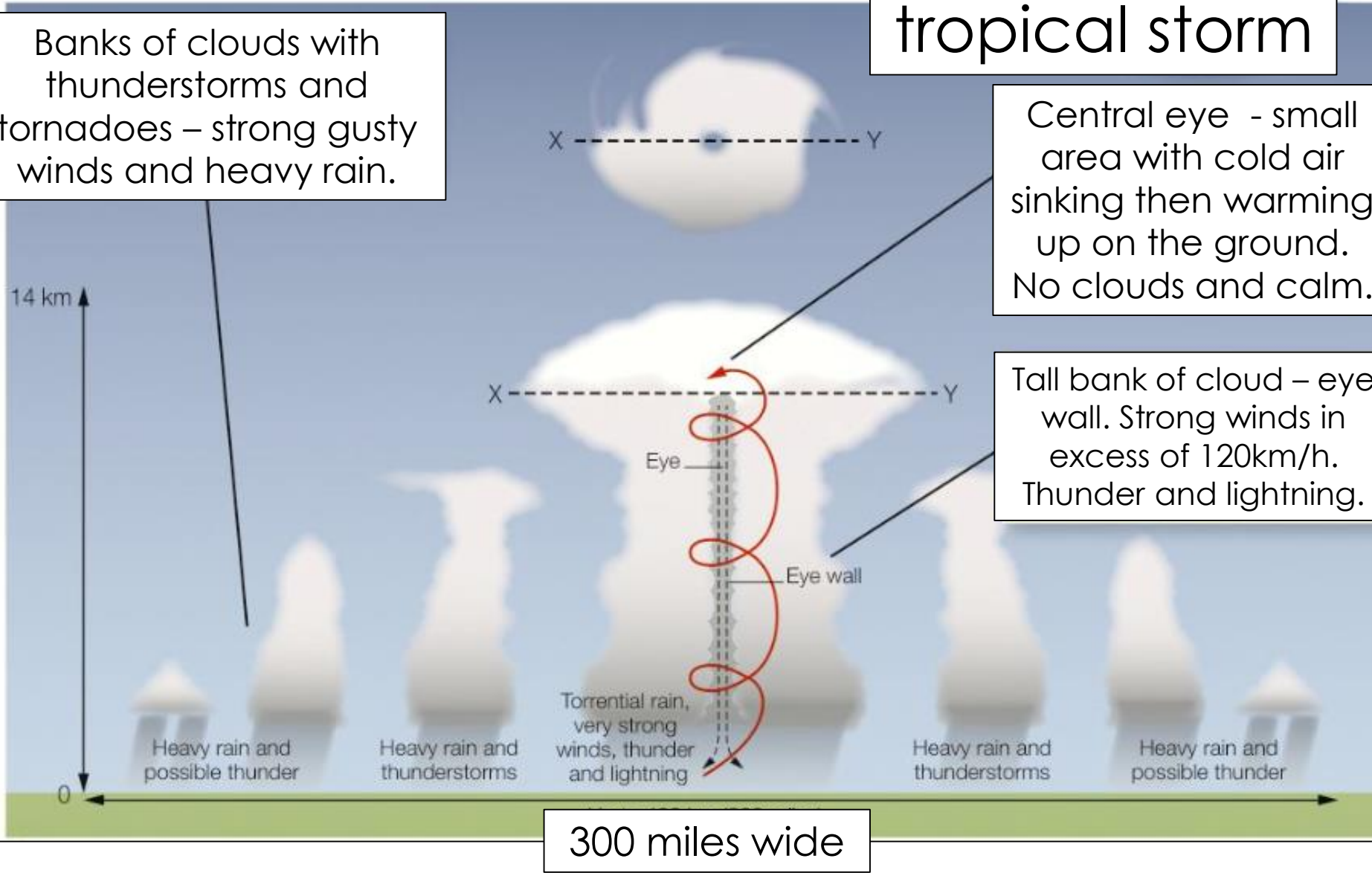
This is the eye of the storm, an area of high pressure and calm conditions.

Structure of a tropical storm

Banks of clouds with thunderstorms and tornadoes – strong gusty winds and heavy rain.

Central eye - small area with cold air sinking then warming up on the ground. No clouds and calm.

Tall bank of cloud – eye wall. Strong winds in excess of 120km/h. Thunder and lightning.



300 miles wide

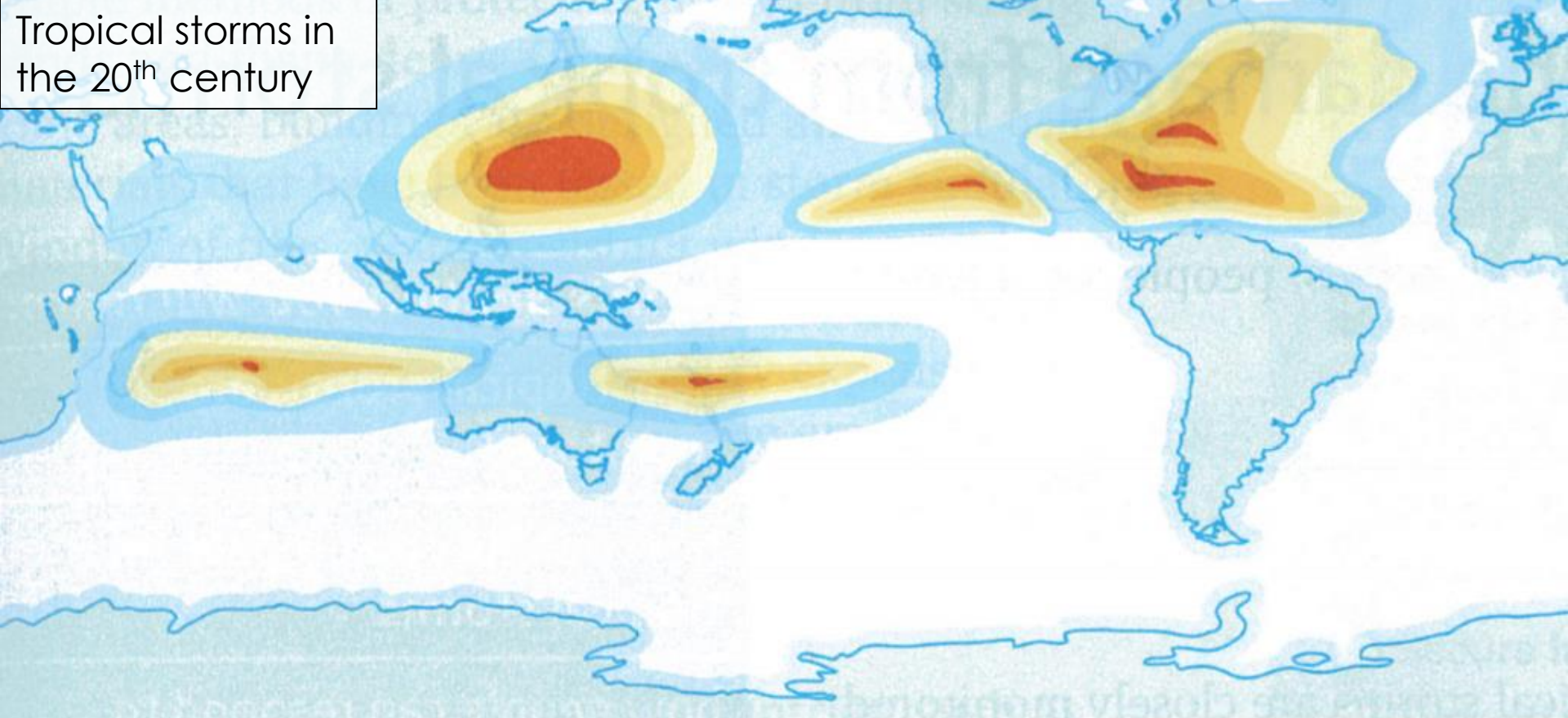
The Saffir-Simpson Scale

- The strength of tropical storms is **measured** using the Saffir-Simpson scale
- Match the descriptions of the **effects** with the correct storm **category** and wind **speed**

<http://www.curriculumbits.com/prodimages/details/geography/natural-disasters-hurricanes.html>

Category	Wind speed (km/h)	Effects
1	Strongest gusts 120-149	Damage to some crops, trees and caravans
2	Strongest gusts 150-179	Minor house damage, heavy crop damage
3	Strongest gusts 180-209	Some structural damage, power failure likely
4	Strongest gusts 210-249	Significant structural damage, widespread power failure
5	Strongest gusts greater than 250	Widespread destruction

Tropical storms in the 20th century

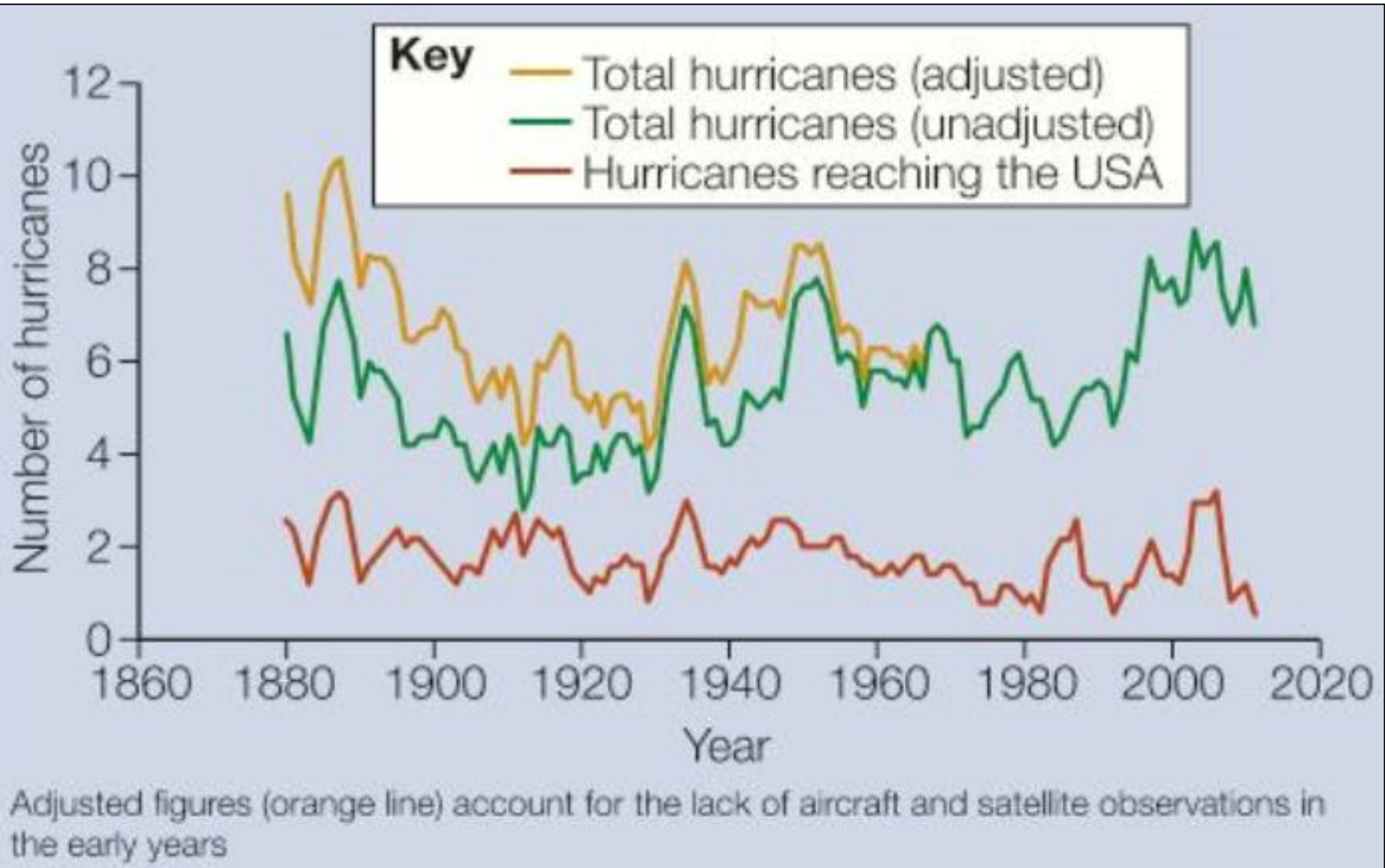


Saffir-Simpson Scale



tropical depression tropical storm 1 2 3 4 5

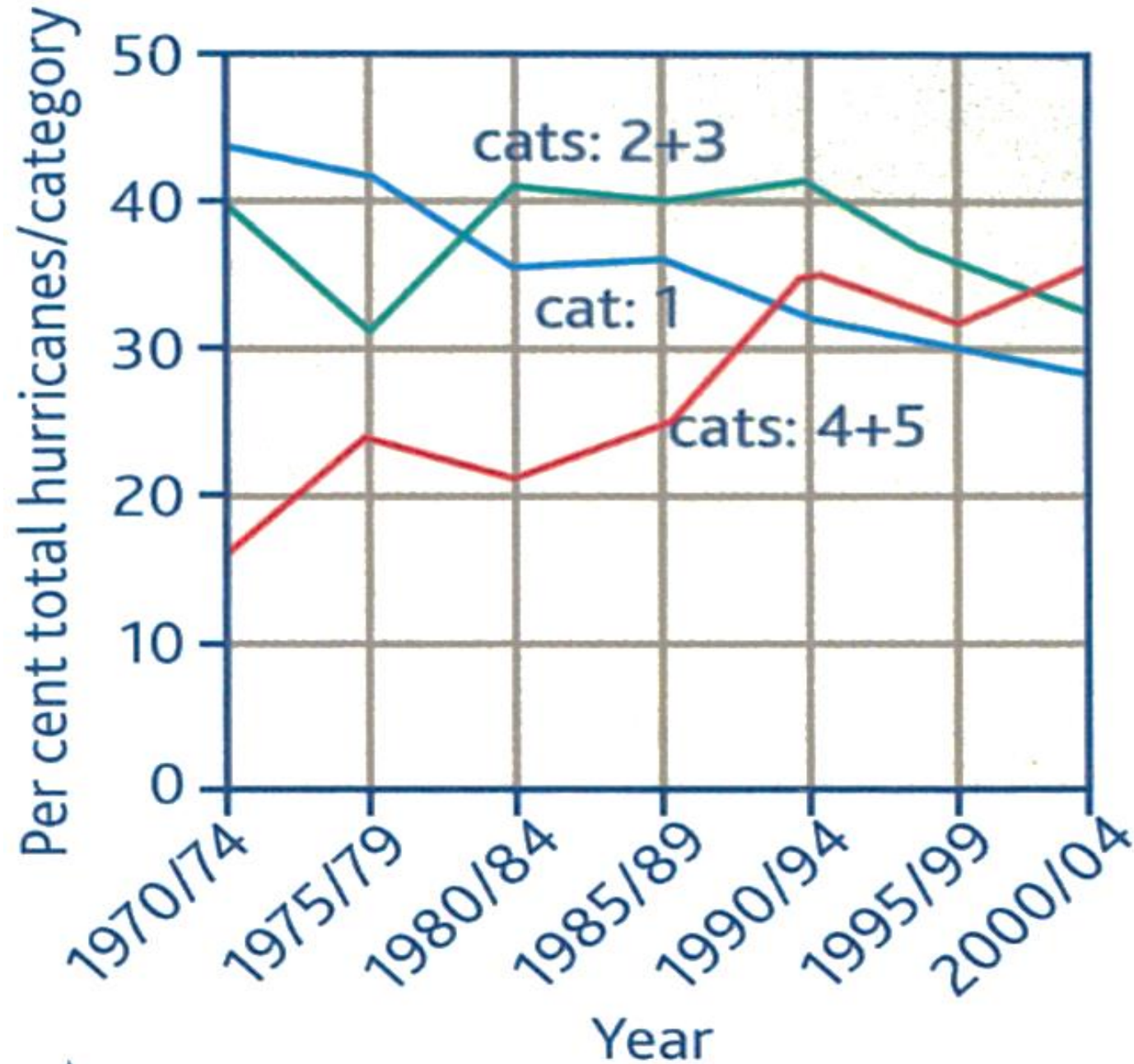
- **Describe** the location of the areas in which the most category 4 and 5 tropical storms occurred in the 20th Century.

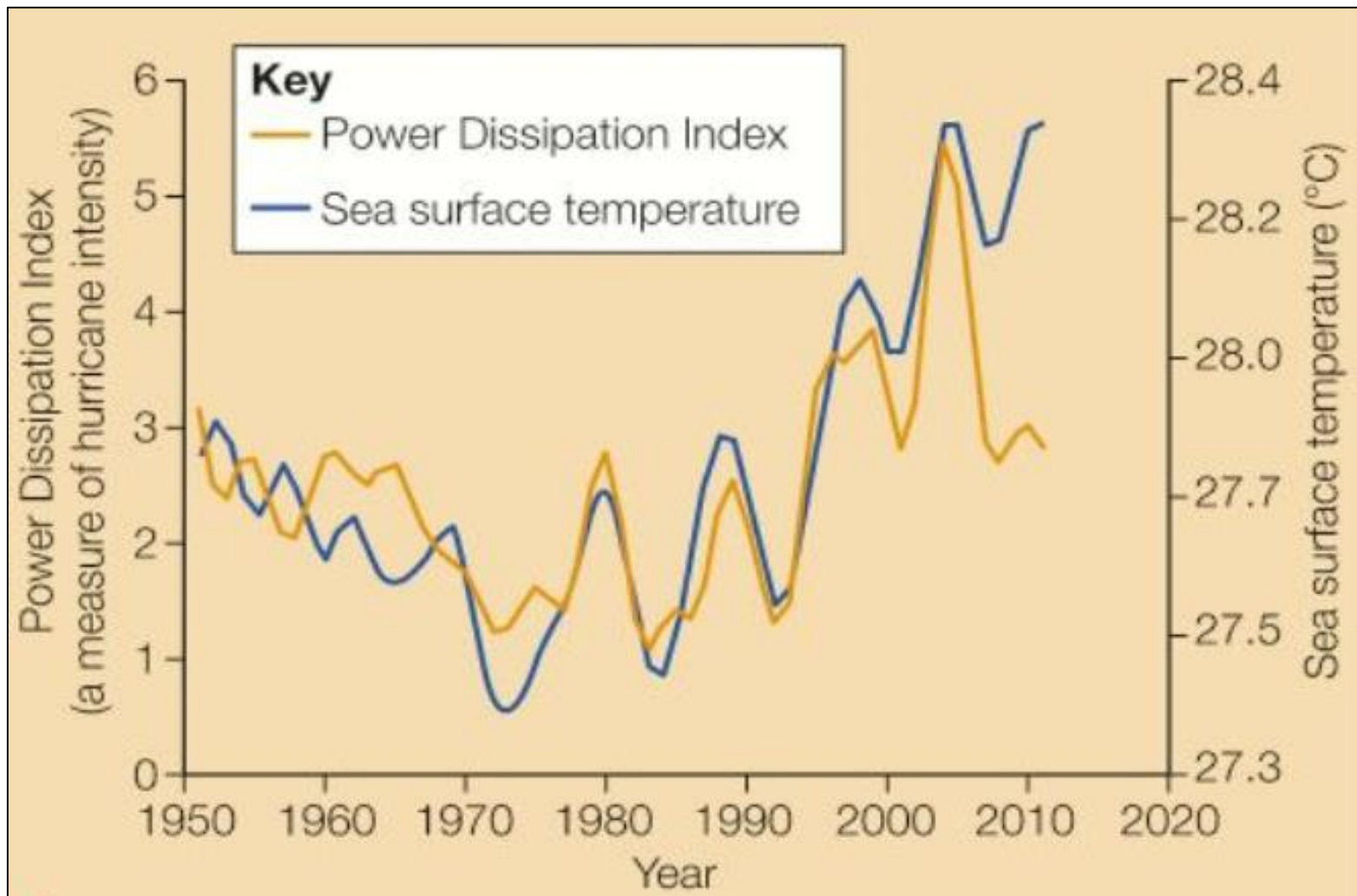


What is the orange line on the graph?
Why is it important?

Frequency and intensity

Changes to categories of tropical storms





T: The general trend is....

E: An example of the power is.....

A: There are also periods where the power of hurricanes...

The reasons for this pattern are that...

Are tropical storms becoming more destructive?

They do seem to be getting more destructive.
6 out of the 10 costliest hurricanes in the USA have happened since 1990.

Why might this be?

- More people are living **near the coast**, in the danger zone.
- There has been much more **building** in these areas in recent years
- More **infrastructure** in in the storms path to damage!
- The value of **property** at the coast has **increased** rapidly, so the costs of **clear-up** have increased too
- Sea level rise, think about **storm surges**...

Why are opinions divided?

Satellite technology has only been used to monitor tropical storms since the late 1960s. Before this, accounts from **ships' logs**, **aeroplane** research flights, and **simple** weather recording instruments were used.

Some scientists have **argued** that the number and strength of tropical storms in the past may have been **greater** than was actually recorded at the time. They also claim that there may have been some tropical storms occurring that we did not know about as they **did not make landfall**.

Extended writing task

***What** is likely to happen to the **number** and **severity** of tropical storms in the **future** and **why**?*

- Use the information from the opinion task and the graphs to answer this question
- Add as much detail as possible. This is an extended writing task, so a few sentences will not be enough!

