

Topic 01: The Annual Climate System

Explain the difference between “weather” and “climate”

How is “climate” an average of weather, and how is it not?

What can “average” conditions often miss about the climate?

Why is it so difficult to predict weather conditions, yet we can make climate predictions, nevertheless?

Explain the three ways in which incoming solar radiation is altered by latitudinal effects?

What is the “latitudinal heat imbalance”, and what does this say about heat transport by the Earth system?

What are the two primary ways by which heat is moved to different latitudes across the Earth?

Explain how the tilt of the Earth impacts the length of the night and day cycle on Earth (hint: it can be very useful to think of this first in terms of what things would be like if the Earth were not tilted)

What defines the Arctic and Antarctic circles and how would these be different if the Earth were more/less tilted?

In terms of the Earth’s tilt and position around the sun, what happens on solstices and equinoxes?

What defines the limits of the tropics on Earth?

In terms of air circulation (think Hadley Cell), what defines the subtropics on Earth?

Why are there desert belts across the Earth in the upper tropics and lower subtropics?

What proxy (indicator) has been widely used to define micro-climate zones across the planet?

What are three factors that can impact climate locally and regionally?

Explain the El Nino Southern Oscillation. How does rainfall vary with each in Western South America?

Why does the El Nino Southern Oscillation have such an important economic impact on the coast of Western South America?