

1. For the Koppen climate system, A-F are primary letters. In slide 10 of the lecture notes, it classified A as tropical rainy, B as Dry(arid/semiarid), C as mild/humid, D as snowy forest, E as polar and H as highland. However in slide 12 to 16, the legend of the graphics classified A as humid equatorial, B as dry, C as humid temperate and D as humid cold. Why is there a difference? Which is the correct one?

I agree that this is somewhat confusing because different sources use slightly different descriptions of the same thing - I could add even more descriptions which are also different. But don't worry, they are similar enough to convey the same meaning and in the end I would mark all of them as correct.

As for the secondary letters f, w, m, W, S, T and F, there is also a conflict in description between slide 10 and slide 12 to 16. What exactly do the secondary letters describe?

The main differences are (1) for D on slide 10 there should be no s (winter) sub-category - my mistake - in which case slide 10 is the same as on slides 12-16 and (2) E on slide 10 is the same as P on slides 12-16 with the an additional sub-division into categories T and F (again, this is nothing to worry about).

The second letter indicates sub-divisions of the main climate group, usually the time of when precipitation (P) falls: f - precipitation all year ; w - precipitation mainly in summer; m - monsoonal climate (usually short dry season only). Second letters W, S, T and F mean desert, semi-desert, tundra and ice-covered regions, respectively.

2. For global air circulation, are the low and high pressure zones consistently low and high through out the year? This is because I remember that there is North East monsoon and South West monsoon with the former caused by the high pressures in the north latitudes when the sun is around the tropic of capricorn, and the latter caused by high pressures in the southern latitudes when the sun is over the tropic of cancer. If this is so then the air movement may not always move towards the equator right? Please enlighten me because I'm quite confused at the moment.

Good question. The pressure zones are consistently low (L) or high (B) BUT they move with the sun (and hence the wind systems move too) - in winter the equatorial L (or ITCZ) is south of the equator and we have NE monsoon (i.e. winds towards the equator); in summer the equatorial L is north of the equator and we have SW monsoon (i.e. winds away from the equator).

For koppen climate system,

Secondary letters, w stands for summer or winter?

In some parts of the lecture notes it represents summer while some it's winter...

It is inconsistency...

The reading shows that the w should stand for winter and s summer

In the lecture notes (slide 10) P stands for precipitation. Consequently, the secondary letters refer to the period where precipitation is concentrated in, i.e. w - precipitation is concentrated in the summer; s - precipitation is concentrated in the winter.

I agree that this is confusing and I will have to change this for next year. A better way is to look at it as secondary letters indicating the dry periods, i.e. w - dry season is in winter; s - dry season is in summer.

Firstly, is the most important material to study for the Examination the lecture notes? For the reading, is it only those points found in the lecture notes are relevant? I answered this question in my last lecture. If you want to score very high, it is best to read everything in the readings.

For example the lecture on Global Climates; when I read the reading, especially on the part on Low-Latitude climates, I was very confused and lost (Wet equatorial, monsoon and trade-wind coastal, wet-dry tropical, dry tropical). As mentioned in the reading, there are seven important features of the global pattern of rainfall; is it the same with the five classes of annual precipitation stated in the lecture notes?

Yes, because they are very similar

Also, in the lecture notes, there are maps showing us the different climates -- the A climates, B, C, D, P and H climates -- are we supposed to remember the different regions marked by the climates? For example, Af (no dry season) eg. Singapore with annual temperature range of 1.7 degree Celsius and precipitation of 241cm, and so on.

I will not ask any detailed questions, but it will help to know the general features indicated in the lecture notes

Secondly, Some points in the lecture notes are not elaborated, so does it mean that we have to refer to the readings for the elaboration of that specific points? For example, in Global Climate Change lecture notes, the various methods (proxy indicator) for establishing past temperatures are not elaborated. Therefore do we need to refer to the reading for the elaborations? In addition, in the lecture notes of overview of natural hazard, must we know the various processes in details? I suppose the readings are meant to elaborate the points. However as an introductory module, are we supposed to know the points in details?

Again, I have answered this in my last lecture. You need to know what is in the lecture notes and apart from this have good knowledge of general concepts. The readings will help to better understand the lecture notes and further introduce some new material which could not be covered in class.

The readings provide a lot of information which in turn confuse me. Therefore, is it possible to do away with the reading? Is it sufficient by studying the lecture notes only?

See above

AP Roth, could you please also check whether the approaches to the following questions are correct?

-->How does air temperature, as a climatic variable influence precipitation?' -- by air masses and their movement produced by global air circulation pattern. Is it correct? plus through the fact that warm air can hold more water than cold air

Must we describe the global air circulation pattern?

only very generally

--> Why are latitude and location important in determining the annual temperature cycle of a station? -- This is because latitude determines the annual pattern of

insolation which determines temperature pattern **good** and location enhances or moderates the annual insolation cycle **here you should discuss the difference between maritime and continental location (i.e. the influence of the ocean on the annual temperature regime).**

In addition, how should I approach this question? -- "Describe the three temperature regimes and explain how they are related to latitude and location". -- Is it describing the equatorial regime, the tropical continental regime and the Multitude continental regime? How about tropical west coast regime, sub arctic continental regime, midlatitude west coast regime,... how many regimes are there?

The question is "describe three" not "describe THE three....". So you can choose any three.

there are some problems which I hope you could help clarify...

Global water issues

Slide 5 - 'Run-off vs water surplus' – is the 'run-off' here mean the same thing as 'run-off' in slide 7?

Yes

What exactly is Eutrophication

Check the respective slide and if not enough try the internet.

and acid mine drainage?

Cleaning solutions in mines often contain large amounts of acidic solvents. When they are released into a stream they can create a very toxic mixture together with heavy metals which are often also dumped by mines.

Why is there a lower base flow after channelization?

Because most of the water is drained into channels rather than infiltration into the surface (base)

What exactly is channelization?

Water is drained away through channels (often manmade, concrete ducts)

Why is there an increase in the frequency and height of flood peaks when there is a decrease in base flow?

After channelization there is no natural buffer layer in the ground which can reduce potential floods after heavy rains.

Natural Hazards

What are 'grounding' forms of oil spills?

Ships are deliberately sunk to the ground (usually to claim insurance money)

Deforestation – what is the basis of the distinction between primary and secondary causes of deforestation?

The distinction may not seem very clear but upon closer look, the secondary causes usually follow the primary ones. E.g. Cattle ranching is introduced to mitigate poverty.

So do forest fires maintain or result in a loss of biodiversity? (there seem to be contradictory opinions in the slides...)

Good point. They can have a positive impact if the area is left untouched after the fire and vegetation is allowed to grow back naturally. However, most of the forest fires are used to clear forest to grow monocultures or agricultural crops which lack biodiversity.

I don't really understand the concept of orbital variability. May i know if this concept is explained in any of our readings? If not, can you explain to me please?

Orbital variability refers to the variations of the earth's path around the sun. As a first approximation the earth goes around the sun on a elliptic trajectory (path). However, closer examination shows that the shape of this ellipse is not constant but varies at a frequency of about 100,000 years. The same is true for the tilt of the earth axis which is changing at a frequency of about 42,000 years and an additional parameter which describes the precession of the equinox (wobble of the earth axis) which varies with a frequency of about 20,000 years. Depending on these variations, the sun is sometimes closer or farther away from the earth which affects the intensity of the solar radiation received by the earth and therefore can affect the climate.

what is the significance of Emmission scenarios? what is the use of Emmission scenarios?

Emission scenarios are predictions of future emissions of green housegases (e.g. due to industrial activity) and help to predict future greenhouse gas concentrations in the atmosphere. They allow to model (predict) the future temperature of the atmosphere.

do we need to memorise the the diff minor codes for the Koppen climate system (eg. Df, Cf)? or do i need to only memorise what is the main characteristic of the main climates (eg. A, B, C, D, E, P, H) in the Koppen Climate System?

Anything that is in the lecture notes can be part of a question.

they are firstly, what exactly is a sunspot n how does it affect climatic changes in the long term?

Sunspots are dark and relatively cool regions on the surface of the sun which appear with a periodicity of about 11 years.

secondly, how does continental movement affect climatic change?

Our climate is affected by the amount and distribution of land mass, because the nature of the Earth's surface determines how much of the incoming solar radiation is absorbed at the surface and hence available to affect our climate and weather. Also, the distribution of the mountains affects wind regimes, which in turn affect the climate (at least locally). You can probably imagine that the local weather and climate are different say in the northern hemisphere if all the land mass were accumulated north of the equator rather than distributed more equally.