EDUQAS A LEVEL GEOGRAPHY

Specimen Assessment Materials - Component 2

Marked Student Responses

The following booklet is compiled from student responses to questions from the Specimen Assessment Materials submitted by centres. Where typed responses have been used for the purposes of legibility, the original student answer has been reproduced faithfully.

The Principal Examiner, in each instance, has provided detailed comments and an indication of marks/levels where appropriate.

All figures and mark schemes referred to in these responses can be accessed by downloading the original Specimen Assessment Materials from the Eduqas Geography A Level homepage.

http://www.eduqas.co.uk/qualifications/geography/as-a-level/

Content:

Question 1 a) i) (5 marks):

- There is fluctuation locally especially in Texas
- The Further North on the map, the increase in severity of water declines
- Nebraska has had overall largest impact of water increase with 25-50 feet
- Areas near the rivers such as South Plaine River have seen the smallest declines
- The greatest decline is in the South in Texas with areas of 150 foot water level fall

Question 1 b) (5 marks):

- The increase in washing equipment has led to water level decline to clean things such as clothes and dishes
- Growing population has led to an increase in drinking water from aquifers has led to water level decline
- Photosynthesis needed for growth of plants has led to decline in aquifer using water to create energy
- An increase in urbanisation has led to decrease in aquifers in plains due to land being concrete and cannot infiltrate
- Deforestation has led to less interception causing precipitation saturating the ground faster leading to more surface runoff and less amount of the water infiltrating to the aquifers

Examiner Comments:

Q1 a) i) (5 marks):
AO3 – **Band 2**. Overall an overview is lacking. The candidate has produced a list rather than a structured analysis of the severity of water level decline. Bullets would not be advisable in a response at this level.

Q1 b) (5 marks):
AO2 – lower **Band 3**. Similar to the response above, bullets are best avoided in these responses. Although the applied knowledge is mostly accurate the link between photosynthesis and human activities has not been explicitly made.

Question 3 (20 marks):

Forest removal can directly influence the operation of the carbon and water cycle as well has having indirect effects upon them and a results in range of feedback mechanisms which will also influence these systems. While the impacts may be distinct within the water and carbon cycles, they also will interlink with each other as there are a number of ways in which these systems are linked.

Forest removal will can have a range of effects on the water cycle. While forests only store only a tiny proportion (just a fraction of one percent) of the world's water stores they have a major influence on water flows. Deforestation will cause a noticeable reduction in interception as trees can catch upto 70% of rainfall, particularly in light storms. A lot of this intercepted rainfall would be evaporated back to the atmosphere, and so the reduction in interception may well reduce this. It would certainly reduce the transpiration of water vapour from forest leaves. This change would be most noticeable in tropical forest where leaves are large and evapotranspiration rates are high. This effect will be less in coniferous forests, or deciduous forests in winter seasons. In addition, water storage within vegetation will be reduced. Rainfall will instead infiltrate into the soils. This may raise groundwater stores and lead to soil moisture saturation. This can increase surface storage and soil saturated overland flow. This in turn may lead to more water flowing into river systems more quickly and leading to higher peak flood flows. 90% of Haiti's forests have been cut resulting in a 20% increase in peak river levels. Typically, a 10% increase in deforestation results in 4 to 30% increase in flood frequency. Small and selective removal of tress within a forest will only have a small effect compared to complete removal of forest cover in a region. In addition the impacts will be greater in areas of tropical rainforest, as the change in interception will be greater and the intensity of the rainfall is higher.

Forest removal will also impact the carbon cycle. Globally forests store 1250 GT of Carbon (including in their soils), with tropical forests as the largest store. Deforestation will reduce the carbon storage within vegetation as trees are important carbon sinks by taking in 1.3GT more Carbon globally each year through photosynthesis (where light and water combine to form carbohydrates in the plant) than they lose through respiration, (where excess carbon produced in metabolic processes). As a result there will also be less Carbon removed from the atmosphere, resulting in higher stores here. If the plants are burnt then further carbon is released to the atmospheric store. A study in tropical forests showed Carbon absorption being reduced by a third 10 years after deforestation while carbon emissions still remained high. Currently deforestation globally is adding 1.5 to 2GT net flux of carbon to the atmosphere each year. The largest sources of this are central Africa, Indonesia and Brazil. Note that there is a negative feedback effect, whereby the increase in atmospheric carbon caused by deforestation leads to plant carbon fertilisation, where plants take in more carbon and speed up their growth, so helping to reduce the atmospheric carbon levels. There are also indirect effects of forest removal, in that reduced decaying plant matter is added to the forest floor. At first the exposed soils release CO_2 though respiration from bacteria and organisms which decompose organic matter. This reduces the soil carbon store and adds to the atmospheric CO_2 levels. Over time this reduces though due to the reduced supply of organic material. Also increased surface runoff from exposed soils will increase soil erosion and further reduce the soil carbon store which is a link between the carbon and water cycle.

The increased atmospheric CO_2 caused by deforestation will influence global temperatures and in turn aspects of the water cycle. It will cause a reduction in global ice stores and increases in ocean stores. It will speed up rates of evaporation, increasing atmospheric water vapour levels and in turn intensity of precipitation. The melting of ice in tundra regions will expose peat soils which can lead

to increased respiration of methane and carbon from them, moving their carbon stores into the atmosphere. Diffusion of carbon into the oceans may increase due to larger ocean bodies and due to the higher levels in the atmosphere.

Examiner Comments:

This introduction might 'question the question' further. What type of forest is under discussion? What context and time scales will underpin the answer?

Paragraph 2 is strong and a forest context finally mentioned. Does 'within' mean water stored as biomass or water held on leaves? This is a little unclear. The candidate shows good use of data to gain AO1 credit.

Paragraph 3 is again strong and shows thorough and accurate knowledge with good use of terminology and data. The candidate constructs strong arguments on negative feedback and changes over time, this is a more sophisticated approach to AO2.

In Paragraph 4 a conclusion to the debate should be included. Ideally, might there be some roundup of the key evaluative ideas such as the scale of forest removal, the location of the forest and the time scale over which its effects are studied? All of these important spatial and temporal themes are in the essay but often only in passing.

On balance, the marks would be awarded as follows:

AO1 – lower **Band 3** Detailed and accurate knowledge and understanding and appropriate use of examples
AO2 – upper **Band 2** A coherent but partial analysis (we might strongly advise this candidate that time should be allocated to produce a conclusion that reflects on the main AO2 ideas arising).

Question 4 - Candidate A (20 marks):

Geological factors include the movement and makeup of rocks on the earth. Different rocks contain different volumes of water and carbon, allowing them to move through the cycle. Another factor could be anthropological factors as humans have a large influence over the equilibrium of systems on the planet. This essay will discuss the significance of these factors on a local and global scale.

Arguably the most crucial geological factor is the type of rock. The geology of a rock determines its permeability and carbon content. The water cycle will flow much quicker through permeable rock, on a local scale this may reduce flooding, however globally, it could affect the volume of water in the cycle at one time as it could contribute to the formation of aquifers. If rock has a high carbon content it is acting as a store, maintaining the equilibrium of the cycle, however when rocks reach plate boundaries and are melted due to intense heat, this carbon is released back into the cycle.

A geological factor that has marginal influence is the age of rock as the same volume of carbon will be stored in each layer of sediment, due to compression of sediment. Also peat bogs are extremely old geological landforms that contain lots of water, however do not have a changing volume of water, they remain relatively untouched.

An essential factor influencing the water and carbon cycles is the action of humans. Humans remove water from aquifers and place dams in rivers, as well as deforestation and urbanisation which all remove water from its natural cycle. The impacts of this are changing landscapes such as desertification and decreased water quality.

anthropological

An arguably more critical factor is the burning of fossil fuels. When humans extract fossil fuels they are removing carbon from stores and transporting it to other, less stable stores. This can become a positive feedback mechanism as with the example of permafrost. As carbon in the atmosphere causes temperatures to rise, the permafrost melts, release large amounts of trapped methane into the atmosphere, further increasing the carbon store. This increased temperature and melting of ice also leads to sea level rise and more exaggerated weather events.

In conclusion I believe that anthropological factors are of fundamentally more significance when influencing the water and carbon cycle as they occur much faster, meaning thresholds are more easily exceeded and spatially occur all over the world, affecting many different stores and flows through the cycle all at once.

Question 4 - Candidate B (20 marks):

Geological factors play an essential role in the carbon and water cycle over millennia. Rock type and soil has a profound effect on the rate of drainage and the movement of carbon between flows and the thresholds of both the water and carbon cycle.

Firstly, geological factors influence water, notably infiltration and throughflow rates. In soil, soil infiltration has a faster flow in comparison to rock due to it being less compacted therefore having larger pores to allow water to penetrate through e.g. ploughed farmland with a high soil horizon has a soil structure with large spaces in comparison to a low soil horizon which is compacted due to the weight of overlying material which decreases its permeability. This in turn, influences the carbon cycle because if there is less water infiltrated into the soil, fewer plants are able to grow and sequester CO2 from the atmosphere to the biosphere. This will be notable in grassland biomes where only 2-10 tonnes of carbon per hectare is found.

In contrast, porous rock e.g. chalk has large pores whereas pervious rock e.g. limestone has joints and bedding planes which can infiltrate water at slower rates in comparison to soil. However, there will be weathering of rocks e.g. limestone which will actually increase the amount of carbon in the atmosphere and will travel to oceans by overland flow and throughflow in the water cycle. Whereas, impermeable rock e.g. granite has limited infiltration, which is less than pervious and porous rock, contributing to increased overland flow and surface runoff. This flow of water could erode permeable rock downstream due to high rates of water flow. This clearly depicts how geological factors having a major influence on the water and carbon cycle and differing geology in turn will impact the extent of the influence on a particular cycle.

Also, geological factors control the Earth's carbon and water cycle in the long term. Precipitation weathers pervious rock e.g. limestone and chalk which contains carbon creating carbonic acid which will flow overland or directly to the ocean. This will impact different pumps; the carbonate pump where calcium carbonate will be used by small structures for shells and then die and accumulate at the base of the sea bed and form sedimentary rock due to high pressure. This flow of carbon from the ocean to the lithosphere will be released from the subduction of plate margins causing carbon to flow from the lithosphere to the atmosphere. A physical pump which will experience a direct flow of carbon in to the ocean and vice versa. This clearly shows the fundamental causality of geology affecting water and carbon flows. In contrast to the first point, geology here impacts the slow carbon cycle which helps to create a dynamic equilibrium within both systems and the water cycle has a vital influence on the ability of carbon flow from the ocean to the lithosphere and lithosphere to atmosphere.

However, human factors including deforestation and urbanisation also have a contributing factor to the carbon and water cycle. Land e.g. rainforests cleared for food production like soya beans have a much lower carbon capacity whereas large woody trees which would've been present contain 180 tonnes of carbon per hectare above ground. As a result there is less carbon sequestration from the atmosphere to the biosphere and in turn, this increases the carbon flow in other areas. For example trees on other areas sequester more carbon which means these trees may reach their threshold earlier and grow at unexpected rates if water levels stay the same. However, as deforestation increases, the interception will decrease and there will be increased overland flow as will occur with urbanisation. This increased surface runoff will take place due to impervious surfaces present which will completely restrict water flows of infiltration. AS a result, this will have a positive feedback and could lead to a flashy flood or increased channel flow at a river. Overall, human factors are just as important because the removal of trees will decrease carbon flow from the atmosphere to the biosphere. This fast carbon cycle in some ways will decrease but may actually not due to human activities including combustion and use of cars which will actually keep the fast carbon cycle the same or even increase it. However, this is dependent upon the

extent of deforestation and what the land will then be used for.

On balance, I think geological factors affect the slow carbon cycle the most in the long-term and water flows including infiltration and overland flow. This is important because the slow carbon cycle is fundamental to sustaining life but fluxes to this cycle are so small they overall have no impact on the dynamic equilibrium in the short run keeping it in a state of equilibrium. In contrast, human activities have accelerated the fast carbon cycle over the last 40 years and have resulted in increased temperatures affecting both the water and carbon flow i.e. precipitation levels which alter surface runoff and infiltration as a result having more consequences on the water cycle in the short run.

Question 4 - Candidate C (20 marks):

The geological composition of a place is decided by the rock or soil type and how it changes over time. This, in turn, impacts the interdependant flows within the water and carbon cycle. Both temporally, in the short and long term, and spatially from a local to global scale. These geological factors also impact both terrestrial and marine flows of carbon & water.

Firstly, as the most significant terrestrial carbon flow is the uptake of CO_2 from the atmosphere via photosynthesis, which allows carbon to be cycled quickly in the fast carbon cycle, between the soil, vegetation and the atmosphere, we must consider the geological factors which may affect this. Areas with the greatest concentration of green vegetation, especially trees with thick and woody trunks, such as in the Amazon Rainforest (which sequesters over 2.2 billion tons of carbon dioxide per year) tend to have loose, sandy soils which have evolved through erosion over hundreds of years. Although these soils have lost a lot of their nutrients and minerals, rich rainforest grow from them. Therefore, in areas with loosely packed soils, carbon will be cycled quickly through photosynthesis and respiration. Furthermore, due to looser eg soils, the water cycle

flows will also be impacted, with greater levels of infiltration, throughflow and groundwater flow, providing that the soil is not at full capacity, ~~where~~ which resultantly leads to soil leaching. Contrastingly, denser soils such as clay will result in less dense vegetation and increased surface runoff, although clay soils tend to store more carbon.

The rock type can play an equally significant role in influencing the water and carbon cycle flows, depending on the permeability of the rock. ~~Permeable~~ This is because permeable and carbon rich rocks, such as chalk and limestone, will result in an increased flow of percolation of water from precipitation and less surface runoff. Resultantly, due to high permeability and increased percolation, more water will be stored in the rock as the ~~a~~ aquifers recharge. Not only does this increase the under ground flows in the water cycle, but also the carbon cycle as the rocks ~~are~~ are a hugely significant carbon store, and the rocks slowly erode with the effects of weathering on the rock, which transports the carbon in solution to rivers or seas. This is where the water will eventually evaporate and continue its journey through the ~~carbon~~ water cycle, while the carbon will enter the marine carbon flows through phytoplankton, then shellfish, and then eventually be stored on the seabed as sediments, as it enters ~~the~~ the slow carbon cycle.

However, human factors also come into play and may be considered as having a strong influence on the flows within the carbon and water cycles. This is because areas which may have carbon rich permeable rock, but also urbanised areas standing above may not affect the water and carbon cycle flows in the same way. This is because the porosity of the rock can be impacted by the pressure of buildings above, making it behave like a denser rock such as granite, which increases the level of surface runoff, resulting in a lower amount of carbon eroded in solution and less water stored in the lost aquifer. However, this can happen naturally in areas with denser rocks such as mountainous parts of South America. And it can also happen as a result of anthropogenic causes due to urbanisation.

The human use of fossil fuels also releases a great deal of carbon, this large release of CO_2 causes increased volcanic activity, which results in higher temperatures, resulting in more rainfall, which then results in more erosional weathering of carbon in rocks, releasing more carbon into the ocean, where it will be stored as ocean sediments. Therefore, it is clear that this fine balance between the water and carbon cycles have been significantly influenced by humans, and it will take centuries of carbon being sequestered to regain equilibrium in the slow carbon cycle.

On balance, I think the extent to which geological factors influence the water and carbon cycle flows in the short term, globally is minimal. Although on a regional scale eg. Amazon Rainforest, Brazil it can have a significant impact on the flows. Therefore, in the short term, I believe that Anthropogenic influences are the most significant as they can throw the fast & slow carbon cycle into disequilibrium in a number of days with an unsustainable use of resources. However, in the longer-term, after humans discover other ways of generating energy, as Costa Rica has been running off of green energy since Jan 2017, due to geological factors and chemical weathering, the carbon stores may rebalance after thousands of years. This processes of carbon sequestration, will clearly be faster in areas such as dover, where carbon is what constructs the ground, and rain is very frequent. Therefore, in the longer term, on a global scale, geological factors may be more significant.

Examiner Comments:

Candidate A - The introduction is not entirely clear but it does attempt to set the scene. Firstly, an opposing factor (anthropological) is established as a counter influence; secondly a spatial framework is introduced (local/global).

The second paragraph shows some accurate and relevant knowledge and understanding of both the water and carbon cycle. The material has also been framed in a discursive way ('Arguably the most crucial geological factor is....') which will help raise AO2 attainment. The account is not entirely secure however. The idea that aquifers are a 'global' influence is not one that everybody will agree with; but an attempt is at least being made to examine different 'contexts', which is creditworthy. The idea about plate melting is a good one; however, this paragraph would benefit from a final sentence being added along the lines of 'Therefore we can see that plate movements (which may be regarded as a geological factor) are a very important influence on carbon release on a global scale'.

The third paragraph is not entirely secure. We can perhaps accept at face value the idea that sediment compression has no influence on carbon storage; but the point about peat bogs does not stand up to scrutiny because often these features are continually growing in size and therefore become *more* important stores of water and carbon over time. Despite this, there would be AO1 credit for mention of peat bogs as it is a relevant theme for inclusion (however the point is not argued in a way that can gain AO2 credit).

The fourth paragraph on human activity is evaluative: humans are shown to be an 'essential' factor. It is a shame that the points are so generalised and that no facts or examples have been included. Candidates should be aware of the importance of *always* supporting arguments with evidence.

The fifth paragraph once again demonstrates the candidate's understanding of the AO2 demand of the essay, beginning with the evaluative point 'An arguably more critical anthropological factor is....' But once again the devil is in the detail: what a pity that no data are provided to support the scale of anthropological carbon emissions (even a basic acknowledgement that we have passed 400 PPM would be useful). It is good to see the positive feedback mechanism mentioned. However, this is delivered in an entirely descriptive way which is not linked back to the *argument*. A good way to conclude this paragraph might have been to add an additional evaluative sentence such as: 'This shows that the importance of particular non-geological factors can actually <u>increase</u> over time on account of natural feedback mechanisms.

The conclusion does little more than repeat what has already been said but does at least provide a coherent ending which is also substantiated: the argument that thresholds become exceeded in the case of anthropological factors - thereby making humans the most important influence - shows evidence of attempted critical thinking in relation to the task set.

On balance, the marks would be awarded as follows:

AO1 - lower **Band 2**. Demonstrates accurate knowledge and understanding of geological and other factors influencing water and carbon cycle flows; however examples are undeveloped or not fully developed.
AO2 - higher **Band 2**. Applies knowledge and understanding to produce a coherent but partial evaluation that is supported by some applied knowledge and understanding.

Examiner Comments (cont.):

Candidate B - The introduction is perfunctory which is a pity: it would be good to see a clearer framework appearing (in terms of temporal or spatial contexts that will be explored; or mention of alternative factors).

The second paragraph begins with a secure grasp of water cycle movements. While some may argue that the discussion of soil horizons is not strictly speaking a 'geological' factor, if the benefit of the doubt is given then this begins as a sound piece of relevant writing: flows have been examined at the local level for varying depths of the soil profile. The synoptic link is also established ('this in turn influences the carbon cycle...') which is indicative of performance by stronger candidates (who typically synthesise their knowledge of water and carbon cycles rather than presenting two separate 'mini essays'). Unfortunately, coherence is lost towards the end of this paragraph: it is unclear what context is being proposed for 'there is less water infiltrated into the soil' and final sentence is unfinished.

The second paragraph shows some understanding of geological factors and uses a range of terminology including pervious, bedding plane. Understanding is not entirely secure however as evidenced by the assertion that the movement of water through joints and bedding planes is 'slower' than soil water infiltration: this is not always true especially if the soil is clay. Again, it is good to see water and carbon material being synthesised in the same paragraph, and there is competent explanation of carbon flows via water in limestone environments. The statement 'this clearly depicts non-geological factors are having a major influence on the water and carbon cycle and differing geology in turn will impact the extent of the influence' provides an excellent AO2 summing-up of what has been said so far (this kind of 'on-going evaluation' is creditworthy of course).

The third paragraph changes tack to 'the long-term' thereby providing a new spatial context which is worthy of AO2 credit. The slow carbon cycle is described and explained reasonably accurately with good recall of terminology such as carbonate pump, subduction and lithosphere. Not only does this paragraph demonstrate very strong AO1 recall, it is also phrased appropriately in line with AO2 requirements i.e. 'this clearly shows the *fundamental causality of geology* affecting the water and carbon flows' (*emphasis added*). The mention of dynamic equilibrium seems a little spurious though (this point is asserted but not explained).

The fourth paragraph offers a competent counter argument relating to the importance of human factors, with strong supporting data (180 tonnes...). It is not always entirely coherent (the sentence 'trees reach for threshold earlier' does not make a great deal of sense). As an overview, this long paragraph might benefit from some actual place names and real world geography being added.
The conclusion appears rushed and lacks coherence unfortunately. The underlying argument - that human factors have gained influence - is fine though, and is substantiated by what has preceded it in the main body of the essay.

As an overview, this is a potentially excellent answer; but the candidate would have done well to spend longer planning carefully what was going to be said - and perhaps cutting the number of words that were written (too often clumsily) in several places. Less quantity and greater quality of writing might have raised the mark even higher

On balance, the marks would be awarded as follows:

AO1 - lower **Band 3**. Detailed and accurate knowledge and understanding of geological and other factors and theories; occasionally light on the use of appropriate and well-developed examples.
AO2 - lower **Band 3**. Applies knowledge and understanding to produce a mostly coherent evaluation of the extent to which geological factors matter most.

Examiner Comments (cont.):

Candidate C - This candidate, to judge by her introduction, has the best grasp yet of what is required when writing an evaluative essay. There is strong use of terminology from the start -interdependent, temporally, spatially, terrestrial. What is perhaps lacking at the outset is a broader 'unpacking' of the meaning of geological factors, or any acknowledgement of alternative factors that may play a role.

The second paragraph begins with an evaluative statement recognizing the 'most significant' status of photosynthesis flows. The material which follows includes some detailed statements which use data and terminology well; however, the actual argument is convoluted and shows a misunderstanding of causality. The loosely packed sandy soils do not play a causal role in the flows which are being described; the candidates might have done better to write less about tropical rainforest but to think harder about the best way to convey the information in order to answer the question which has actually been set. It is untrue that the soil is responsible for the vegetation and thus in turn its carbon flows. By the time she is writing 'contrastingly, denser soils such as clay will result in less dense vegetation...', the candidate has veered badly off track both causally and conceptually.

The third paragraph is framed in an evaluative way ('rock type can play an equally significant role...') and makes a very good attempt at forging links between the two cycles using the context of chalk and limestone. The account is not entirely secure - there is a tension between describing the rocks as a water store while at the same time arguing large amounts of carbon are being transferred in solution (and a truly excellent account might address this e.g. by acknowledging that large stores may also be subject to large inflows and outflows at any given time). Nonetheless, this is a strong section of writing both in terms of AO1 and AO2.

The fourth paragraph is weaker, suggesting the candidate has 'run out of steam' and cannot sustain the quality seen in paragraph three. Almost 100 words are used to convey the un-evidenced argument that if you build on top of an aquifer it may result in compression and reduced flows (as you can see, the point could have been made by a single sentence added at the end of paragraph 3). Candidates need to avoid wasting time writing long sections of generalised material which will do little to increase either their AO1 or AO2 level of attainment.

Paragraph 5 makes the assertion that humans have increased volcanic activity because of carbon emissions but this surely needs some evidence to support it? Moreover, this would have been a very good place to introduce data revealing the significance of anthropogenic carbon flows in GtC/year. The feedback cycle which is suggested here is very generalised with no mention of local contexts: is there increased rainfall everywhere as a result of higher temperatures? Do all rocks become more eroded and release more carbon? Greater care is needed.

The conclusion is not as strong as it may at first appear. Although many key phrases such as 'on balance', 'in the short term', 'unsustainable' and 'longer term' are deployed, the arguments actually put forward do not reflect either reality or what has preceded the conclusion in the main body of essay. Surely geological factors *do* bring significant place-to-place variations in water and carbon cycle flows in the short term (i.e. 'here and now')? The conclusion also veers off into providing new information about 'green energy' and ends with the assertion that 'sequestration will clearly be faster in areas such as dover (*sic.*) where carbon is what constructs the ground and rain is very frequent'

On balance, the marks would be awarded as follows:

AO1 - higher **Band 2**. The material shows accurate knowledge and understanding but the examples are not always appropriate or well developed which is needed for Band 3.
AO2 - higher **Band 2**. Knowledge is applied but understanding is not always coherent; the evaluation is partial insofar as it does not stand up to critical scrutiny in several places.

Question 7 – Candidate A (20 marks):

The concept and definition of a national border is contested and open to interpretation, perhaps increasingly so since the end of WWII. As globalisation has increased during the post-1945 period, many have argued that national governments are losing control of their borders. These claims often focus on the growing role of intergovernmental organisations, in particular the UN and its branches the UNHDR and the UNCLOS, in determining international law. This essay will examine the power relationships that exist between national governments and these intergovernmental organisations, as well as the rights and responsibilities of national governments with respect to migration and ocean governance. The social, economic, environmental and political implications of these issues will also be discussed.

Perhaps the most important and pertinent issue concerning national border control is the transnational movement of refugees. Due to the number of refugees globally, and the frequency of these crises, this issue is particularly relevant and of a heightened significance on the world stage. The 2011 Syrian refugee crises has displaced 5 million. Article 14 of the UN's Universal Declaration of Human Rights states that all have the right to seek and enjoy asylum. This law forced Turkey to accept 2 million of these migrants, and house them in refugee camps. From this example, it is clear that national governments have lost a degree of control, with many countries forced to unwillingly accept the risk of housing refugees. However, not all nations have adhered to Article 14 as closely. Hungary and Greece have been reluctant to accept any migrants at all. The UN's laws and ideals have not been fully achieved in these cases, and some countries have retained a degree of control, leading to a perceived inequality.

A potential counter argument is national government control over economic migrants. The control of these migrants is still at the discretion of national governments, who can determine policy as they see fit. This arguably limits the degree to which national governments have lost control. For example, New Zealand maintains a policy of accepting only quality migrants or those that fulfil criteria such as youth, skills and work experience. This policy allows it to adapt its migrant intake to match the needs of the country. Economic migrants constitute a significant proportion of all international migration, and for these movements of people it is clear that little to no control has been lost by national governments.

An important dimension of this debate is the ability of the UNCLOS to define a nation's oceanic borders, and determine the laws concerning these. The UNCLOS outlines two boundaries; a nation's territorial waters (which lie 12 nautical miles offshore) and its Exclusive Economic Zone (which lies 200 nautical miles offshore). In both regions, a nation is forced by international law to allow unimpeded and innocent right of passage. This creates problems in areas such as the South China Sea, which contains areas of conflict where the EEZs of three countries (China, Philippines and Vietnam) overlap. This highlights the extent to which the national borders are a contested concept. Regardless, over 250 million tonnes of oil passed through the region in 2005 from a range of countries engaged in international trade. This is clearly a significant amount of oil, over which the nations whose borders are being breached have no control. The oil tankers transporting this oil also bring many invasive species in their ballast water, causing environmental damage in a country's domestic waters. There is no doubt that a significant degree of power has been transferred from national governments to intergovernmental organisations.

A further relevant issue, although admittedly of less international importance, is the terms of the UNCLOS concerning landlocked countries. Under the UNCLOS, all landlocked countries are ensured an unimpeded passage to the sea through their neighbouring countries. In 2016, Paraguay transported over $3b in exports through Argentinian territory, mainly in oil. In this scenario, Argentina has clearly lost control of the goods crossing its borders. However, this argument is limited by the fact that these laws affecting relatively few nations globally, and that the passage of goods are subject to regional agreements (in other words, they are still in part controlled by national governments).

On balance, national governments have indeed lost a great deal of control over who and what is crossing their borders. This is perhaps best evidenced by the international movements of refugees, and to an extent by the flow of goods through a nation's EEZ as determined by UNCLOS. However, governments have not lost complete control, and each state still retains a level of self-governance and autonomy, as can be seen by the significant number of international economic migrants that are subject to national law and policy. I would agree that since the growth of large intergovernmental organisations since 1945, an increasingly notable amount of power is being transferred from particular governments to the intergovernmental organisations, the most important of which is undoubtedly the UN. With increasing globalisation both facilitating and necessitating the further growth of intergovernmental organisations, I believe this shift in power is likely to continue into the future.

Question 7 – Candidate B (20 marks):

This essay will discuss the issues surrounding the control and management of national borders. Borders can be defined as the line separating two countries, however they are often contested. The word control is difficult to precisely measure and can be subjective.

A key point to highlight is that some states are deemed to be 'powerless' of who and what is crossing their borders. An example of this is the DRC and surrounding countries, including Uganda and Rwanda. Most would deem these states to have no control over cross-border militia and refugee movements e.g. the Mai-Mai militia entering the DRC, as a result of transnational ethnic groups and little border infrastructure. However, it is important to note that not all national governments are powerless in controlling their borders.

Conversely, a critical argument is that most countries have restrictions on both migration flows and the flow of goods e.g. quotas. For example, both the UK and Australia have a points-based system which allows them to control what migrants enter their country e.g. highly educated doctors. However, in the case of the UK (and all EU members) this control is limited by the free movement granted to all living in the EU e.g. the UK could not prevent 1 million Poles moving to the UK after the 2004 A8 accession. Moreover, most countries have signed the UDHR which guarantees refugees entry to these countries. Although, in practice this is not always the case, for example Hungary only accepted only 9% of asylum applications in 2012. The UDHR also guarantees everyone the right to leave any country. Despite the exception of North Korea, whose government requires an exit visa if someone wants to leave, almost all other countries cannot prevent people from leaving. This highlights the varying levels of control maintained by different national governments over their own borders, showing that more globalised countries are likely to have less control due to their involvement in international agreements.

Ocean governance plays quite an important role in control over borders. Some may argue that countries have gained control due to the expansion off EEZs from 3 miles off of a country's coast pre-1939 to 20 nautical miles in 1982. This is a weak argument as UNCLOS guarantees the 'right of innocent passage' in territorial waters of any state, which national governments cannot control. This has led to a rise in smuggling and transboundary pollution events e.g. 119,000 barrels of oil spilt in the English Channel in the 1960s which impacted over 120,000km of English and French coastline, which they could not prevent.

Another increasingly crucial factor is the rise of globalisation, which has turned from mainly the transfer of goods to increasingly the exchange of services and ideas. This has been facilitated by the growth of ICT and the laying of fibre optic submarine cables e.g. SEA-ME-WE4. MNCs are usually the ones to lay these cables e.g. Google's Faster, and UNCLOS states that they can be laid in the EEZ of any country, thus national governments cannot control this. Furthermore, the vast influence and scale of access to the internet/broadband e.g. there are now more mobile phones than people on the planet, means it is very difficult for national governments to monitor and control what ideas/information crosses their borders

e.g. the rise of extremist web accounts on Twitter and other social media in the UK and France. However, there are some exceptions e.g. China's firewall and North Korea, but these are unlikely to be fully able to control these flows, especially as time goes on.

On balance, I think national governments have not got control of who and what is crossing their borders, however, there are vast variations between states. Overall, countries that are more globalised tend to be more interdependent and therefore have less control e.g. through the participation in international agreements such as the Shengen agreement. Although this may be reduced in the future if the current trend of de-globalisation continues e.g. many in the UK voted for Brexit to 'regain control over our borders'. However, there is little way of reversing the effects of shrinking world technology, which has facilitated data exchange e.g. fibre optic cable transmit 99% of international data. The use of 'lost control' in the question implies that governments once had full control of their borders and now have none. Although I think that national governments do not have full control at present, this essay has also shown that many do have some form of control, however weak it may be. Furthermore, national governments have never had full control of their borders as a result of the shared global commons and transboundary pollution events. Also, many borders are contested and thus it can be argued that people or goods have or have not crossed borders in these cases.

Examiner Comments:

Candidate A - A substantial introduction introduces important ideas including intergovernmental organizations in the postwar era, and also establishes a social, economic, environmental and political framework for the discussion. A promising start.

The second paragraph provides accurate and detailed information which is both contemporary and highly relevant to the discussion - so scores highly according to the A01 criterion. There is robust AO2 discussion - 'National governments have lost a degree of control... Not all nations have adhered to Article 14 closely... Some countries have retained the degree of control.' Here, the content is well discussed.

Paragraph three begins 'A potential counter argument..' which is a good rhetorical style to adopt. The contrast with discretionary measures taken by national governments is excellent and partially supported with evidence of New Zealand (a shame the UK's points system is not used as evidence also). The qualification that economic migrants are a significant proportion of migration - and are being controlled - is an excellent argument in the context of the question.

Paragraph four shifts to oceans, showing good discipline by the student in terms of how he is using his allocated time to cover both topics. The AO1 recall of UNCLOS, South China Sea and oil movements is all good. So too is the AO2 argument that national power has been lost. This student goes a step further than merely asserting loss by developing and expressing the argument geographically i.e. the transfer of power from national to intergovernmental level. Excellent!

Paragraph five is an unexpected use of the theme of landlocked countries - but adapted brilliantly to this essay in an entirely relevant way. One country loses control of their borders because of an international agreement.

The conclusion is substantial: the candidate clearly understands that one of the best ways to demonstrate to an examiner that the AO2 criterion is understood is to offer a substantial summing up (which ideally does more than merely repeat what has already been said!) Doing so under exam conditions involves very careful use of time (which the best candidates are expected to be able to do). This conclusion does a little more than repeat prior material because there is an argument offered that the shift in power is likely to continue into the future.

Examiner Comments (cont.):

On balance, the marks would be awarded as follows:

AO1 - higher **Band 3**. Detailed and accurate knowledge and understanding of a balanced range of migration and oceans issues.
AO2 – higher **Band 3**. Thorough and coherent evaluation well supported by evidence; discussion of complex interlinkages between national and global governance.

Candidate B - This good short introduction shows how much can be achieved with just three sentences: key terms can be defined; and the underlying assumptions underpinning the key word such as 'control' can be immediately brought into focus.

The first paragraph provides good AO1 evidence to support an argument that some states are relatively powerless; the argument is carefully qualified by noting that not all national governments are this powerless.

The second paragraph starts well using connective language ('conversely') and proceeds to provide very strong and concisely written evidence of migration controls in various contexts. The focus shifts to refugees and the fact that some countries do not honor their obligations to accept asylum applications. There is so much in this paragraph that the student really should have separated it into two different paragraphs. There is a danger of some of the nuances getting lost and there is some excellent material buried in this very dense paragraph.

The third paragraph shifts quite rightly to ocean governance - the student has planned her use of time very well. Excellent recall of ocean laws and issues (AO1) is wedded to a focused discussion of national government control.

The fourth paragraph shifts to data flows through territorial waters; once again supported by excellent AO1 information used to support strong arguments about the great difficulty now faced by national governments to control the flow of ideas such as extremism. The paragraph suggests a well informed student has written this.

The conclusion is very substantial and takes us logically through a number of 'summing up' steps which qualify the extent to which the statement is true according to (1) haggle over lies the country is (2) whether it has signed up to particular agreements or may be on the verge of tearing up those agreements (3) recognizes data controls may be impossible regardless of political decision-making and (4) concedes national governments maybe never had full control in the first place.

Overall it is hard to imagine a better essay being written under timed conditions. It is not perfect (see comments about long paragraph) but perfection is not a requirement for the award of full marks.

AO1 - top of **Band 3**. Detailed and accurate knowledge in relation to both global migration flows and flows across oceans.
AO2 - top of **Band 3**. A thorough and coherent evaluation that discusses interlinked effects and is supported by evidence throughout.

Question 10: (30 marks)

The mitigation of risks carried out by the governments of urban areas help to protect the people, livelihoods, businesses and environments which depend on the survival of that area. These risks can come in all different forms, whether they be tectonic, social, economic etc. BY implementing strategies to manage these risks, they can have both positive and detrimental effects on the characteristics of these places, depending on whether risks are managed well or poorly.

Firstly, the management technique which arguably has the most immediate effect on urban areas would be hard engineering of barriers to protect against the hazards of tsunamis etc. Protective action such as the construction of full flood barriers and reinforcement of buildings can change the way the urban area feels for residents. Japan, for example, a nation frequently susceptible to the threat of tsunamis, invests millions of dollars into the hard engineering of flood walls, buffer gardens and forests, and the elevation of roads and bridges between urban areas and the ocean. This alters the special characteristics of the areas acted upon as more physical obstacles are being constructed to safeguard the wellbeing of these major cities. We may contrast this with an area such as the Philippines (shown in red on Figure 6), who hasn't got the national budget to spend on hard engineering barriers for tsunamis, will not experience this change in urban characteristics as somewhere like Japan (also shown in red).

In addition to the physical changes these urban places experience as a result of mitigating construction projects, they may also experience a social change as residents feel more protected from the risks posed by tsunamis, and tourists may feel more inclined to visit. This contrasts with the feeling experienced by locals of urban areas such as Alexandria or Barranquilla (shown in Figure 7 to be predicted a <100% annual loss of land due to sea level rise by 2050), due to this risk being a much slower, gradual one. Tsunamis have a much shorter onset, which is why the comfort provided by barriers/walls may have a much greater effect on the area's social characteristics, than the same barriers will have to protect against sea level rise.

As well as hard engineering, soft engineering can also be utilised when dealing with hazards in order to mitigate their effects. The use of seismic hazard mapping in urban areas can greatly reduce the risks of earthquake damage. US states such as California have legislation in place which requires the proper mapping of urban areas (such as Los Angeles or San Francisco) in order to provide the proper spatial and accessibility characteristics required for minimal damage to buildings, and ability for emergency services to rescue the injured. This is especially needed (as seen in Figure 3) due to its proximity to the San Andreas Fault (the conservative plate margin running between the Pacific and North American plates), which causes so many earthquakes in the area. In terms of characteristics, this hazard mapping rsults in the dictation of the location of services and residences in these urban areas in order to reduce the short and long-term risks of earthquakes.

This contrasts with areas such as Mexico City (also considered to be in a 'very high risk' of seismic hazards), due to the differing socio-economic characteristics of the two areas. Whilst seismic mapping may be helpful to the areas of Mexico City, it may have a lesser effect on the characteristics of place due to the lack of enforcement of such planning codes. With corruption evident and squatter settlements growing , the likelihood of hazard maps having a profound impact on the damage an earthquake may cause is less than that which may be felt in LA/San Francisco.

In conclusion, there are multiple ways risk management can have an effect on the characteristics of urban areas, whether they be physical (through hard engineering) or more social (such as seismic planning). But these management techniques can have different effects on the characteristics of urban areas depending on where they are in relation to areas with poor/rich incomes, or the type of risk they protect from.

Examiner Comments:

A formal introduction is presented, which establishes possible structure discussion i.e. tectonic, social, economic, positive and detrimental risks and effects.

The very long second paragraph deals with engineering as a form of hazard adaptation. The focus is at the national level e.g. Japan and the Philippines, which is a shame as the essay title deals with urban areas (a more localised focus) and the figures deal in the main part with risks at city level. Some reference is made to Figure 6, however, gaining a little AO3 credit. The point about the feelings of tourists is valid as a place perception. Figure 7's sea level rise is then referred to - and the slow onset of change. This is a good point but not used very effectively. Much of this material needs to be restructured in a more coherent way which is fully focused on place/area characteristics.

The third paragraph explores soft engineering and seismic hazard mapping - and attempts to make a link with 'the proper spatial and accessibility characteristics required' - this phrase is not very easy to understand and is an important missed opportunity for the candidate. A point is finally made that hazard mapping may result in the 'dictation of the location of services' - but again this is not particularly clear or coherent.

The fourth paragraph applies knowledge of Mexico City to the answer but then struggles to make a case about how seismic mapping would actually affect the characteristics of places (the argument appearing to be that people simply ignore the authorities; the impact of hazard management on place characteristics is thus left unclear). Overall, the candidates struggles to make much of a case about how hazard management affects characteristics of urban areas. One of the figures -terrorism - is ignored entirely.

On balance, the marks would be awarded as follows:

AO1 - higher **Band 2**. Some reasonably detailed knowledge and understanding of risk management.
AO2 - higher **Band 2**. The material is not very well applied to the question which has been set and lacks coherence in several places. But there is some partial evaluation of place changes and some use made of specialised concepts such as mitigation.
AO3 - higher **Band 1**. One figure is entirely ignored, the others are used in a very superficial way resulting in a limited analysis.