



## Poole High School Sixth Form

### A Level Geography - Transition Courses

Read both articles (Subject Content Overviews) and:

1. Underline as you read any key words you don't understand- look them up
2. **Highlight** key points
3. Summarise in two paragraphs the gist of each article
4. Bring to your first lesson back

Select one book from the reading list and read it over the summer holidays. All are available cheaply on Amazon (second hand even better!)

#### Reading List: A level Geography:

##### **Non-fiction:**

"Behind the Beautiful Forevers" by Katherine Boo  
"Notes from a small island" by Bill Bryson  
"Emergency Sex... and other desperate measures" by Cain, Postlewait and Thomson  
"Why I'm no longer talking to white people about race" by Reni Eddo-Lodge  
"Mad, bad and dangerous to know" by Ranulph Fiennes  
"The New Silk Roads" by Peter Frankopan  
"The Economics Naturalist" by Robert H Frank  
"Histories of Nations" Edited by Peter Furtado  
"This changes Everything" Naomi Klein  
"Prisoners of Geography" by Tim Marshall  
"The Power of Geography" by Tim Marshall  
"How England made the English" by Harry Mount  
"When Rivers Run Dry" by Fred Pearce  
"City of Thorns" by Ben Rawlence  
"Fast Food Nation" by Eric Schlosser  
"The Good Immigrant" by Nikesh Shukla (Ed)  
"Wild" by Cheryl Strayed  
"When a billion Chinese jump" by Jonathan Watts

##### **Fiction:**

"Americannah" by Chimamanda Ngozi Adichie  
"Half of a yellow sun" by Chimamanda Ngozi Adichie  
"Brick Lane" by Monica Ali  
"An unsafe haven". By Nada Awar Jarrar  
"Girl, Woman, Other" by Bernardine Evaristo  
"Exit West". By Mohsin Hamed  
"The Kite Runner" by Khaled Hosseini  
"Haifa fragments" by Khulud Khamis  
"A short history of tractors in Ukrainian" by Maria Lewycka  
"Dust" by Yvonne Adhiambo Owuor  
"Shantaram" by Gregory David Roberts  
"NW" by Zadie Smith

#### **General Reading/Magazines/Publications:**

- Any good broadsheet
- Focus
- Geographical Magazine
- National Geographic
- National Wildlife
- New Internationalist
- The Economist
- Geography Magazine
- Geography Review
- Permaculture
- Countrylife
- New Scientist

# Changing Places

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## New A Level Subject Content Overview

**Author:** Richard Phillips, Professor of Human Geography, Department of Geography, University of Sheffield.

Professor Phillips was a member of the A Level Content Advisory Board (ALCAB) subject advisory panel for geography.

### Introduction

Geographers share an interest in places and the ways in which they are changing: our high streets with their changing mixes of businesses and public spaces, for example, and residential neighbourhoods, churned by waves of migration. To understand urban and rural places such as these and the processes they illuminate, it will be helpful to develop a more general understanding of place. So, as Stephen Daniels has observed, 'it is not just that specific places are being studied, but the very idea of place' (Daniels 1992, p.310). The following identifies some of the key theoretical concepts and perspectives that geographers use to identify, research and better understand the geographical nature of places.

In the Changing Places section of A Level Geography, the concept of place significantly progresses upon GCSE understandings of this term, while it anticipates those in higher education, benefiting those who will go on to study geography at university. At GCSE level, place is understood as locality, a geographical scale somewhere between the home and the region. At A Level, a more complex picture of place emerges. There are two aspects to this. First, place is understood as a geographical nexus of connections and linkages including flows of people, ideas, information, wealth and things, which come together in and define a geographical location or locality. Since these flows reach from the local to the global, place is not simply a synonym for locality, or the opposite of the global. A Level students will study place through at least two localities – one where they live, and one or more contrasting locations. Through these localities, they will have understood how place exists in and through its wider linkages and relationships, which assume economic, political and other forms.

A second dimension in understandings of place, more closely associated with cultural geography, refers to meaning. Place has been defined as **location + meaning**. In this equation, **location** refers to a position within abstract space, such as a grid reference. **Meaning**, as the term is used here, has two components, and it is essential to recognise both. First, places can be meaningful to individuals, in ways that are **personal** or subjective. These meanings may be expressed in terms of the perceptions of place, for example, or of particular associations or

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attributes of place such as danger or beauty. Second, places can be meaningful at a **social** or cultural level, such that meanings are shared, for example when some but not all members of a community or society share an understanding of a place as beautiful or significant in some way. Through meaning, rather than scale, it is possible to be precise about place, distinguishing this from related terms and concepts such as area, landscape and region, which are closely related but not synonymous.

Places are dynamic, changing both in terms of their material human and physical geographies, and also the meanings that are associated with them. Therefore, all places are **changing places**, in constant states of what geographers have variously referred to as 'becoming' and being transformed (at different rates). This means that, to develop an understanding of changing places, it is necessary to be attentive to both components of place – their material geographies (i.e. their geographical features and characteristics) and geographical meanings – and to see that, though they do so at different speeds, places change constantly.

Some themes introduced in the A Level are developed in greater detail and complexity in higher education. The A Level introduces an understanding of how different groups of people can see places differently, and have different scope to shape those places. This introduces a more political understanding of place, which focusses upon contestations of and through place, which may be pursued at university. At that level, there is also more scope to explore metaphors of place, including the wider understandings of how place-based language and ideas work in society, including to position individuals and groups as insiders and outsiders, and to constrain their behaviour and prospects.

### Concepts, Concerns, Content

Key geographical concepts and concerns and an introduction to the theoretical underpinning of them

Peter Jackson (2006, 199) has drawn a distinction between the vocabulary – 'a virtually endless list of place-names' – and the grammar of geography, the concepts and theories that connect and make sense of those geographical facts. Jackson's grammar of geography begins with 'space and place', continuing with other key concepts including scale and connection, proximity and distance, and relational thinking. Geography, understood in this way, means more than memorising facts and more than armchair theory, and it envisions geographical imagination as a **dialogue between observations and ideas**, beginning with place.

*Social, economic and demographic characteristics, relationships and connections of places* The two human geography themes within the new A Level core curriculum – Changing Places and Global Systems – should be seen, not as scalar opposites, but as interconnected spheres and processes, shaping and being shaped by each other. Doreen Massey argues that **places are shaped by internal and external linkages**, which bind the local together with the global. This is explained as follows in the ALCAB report, on which the new A Level is based:

*Relationships and connections between people, the economy, and the environment help to explain why places are dynamic and constantly changing. Relationships and connections operate through a combination of local forces and links between communities, such as employment opportunities and migration, and external forces operating at different scales from regional to global, such as government policies, the decisions of multinational corporations or the impacts of regional or global economic*

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*restructuring. Those forces for change are reflected in the demographic, socio-economic and cultural characteristics of residents and in the fabric and nature of places. (ALCAB, July 2014)*

Massey's concept of a global sense of place illuminates the ways in which places are being made and remade in the age of globalisation and accelerated mobility of people and things. Some observers worry that globalisation is eroding places, reducing once-distinctive places to uniform suburbs and 'clone towns' dominated by chain stores (Creswell, 2008). Massey argues, instead, that connections can lead to an endless series of specificities, each contributing to the 'accumulated history of a place'. From this perspective, places are being reshaped, rather than simply eroded, through local and distant connections. This understanding of place as a nexus of connections and linkages has counterparts in economic geography, where (as the *Dictionary of Human Geography* puts it) '[place] stands for the necessity of economic **processes** to be grounded in specific locales and for those locales to be proactive competitors within the global economy' (Henderson, 2009, p. 539).

This emphasis on connections and linkages signals the intrinsically dynamic – moving, changing – character of place, suggesting that places are **always changing**, even if this is faster and more obvious in some cases than others. Massey suggests that, though change can be unsettling, resistance to change and '**attempts to stabilise** the meaning of particular envelopes of space-time' (Massey, 1994, 5) are ultimately unrealistic, attempts to swim against the tide. Better to accept that places change and embrace the double meaning of 'changing places' in order to have some agency in this: changing places are always already changing, and they are being changed, by people.

### *Meanings and representations attached to places*

When a place cannot be defined simply in terms of scale, as the opposite of the global, but also of the kinds of linkages and relationships identified by Massey, attention shifts not simply to the flows of people and things and the geographies they shape, but also to the ways in which these processes and the geographies they shape are understood: their **meanings**. Peter Jackson explores meaning in his seminal cultural geography text, *Maps of Meaning* (1989), which took its title from cultural critic Stuart Hall's definition of culture, and explored the ways in which individuals and groups find and make meaning in places, landscapes and other geographies. Developing this idea, Tim Creswell (2008) explains place as 'a meaningful segment of geographical space'. Thus, for example, 'Latitude 51° 30' 18" N, Longitude 0° 1' 9" W is a location but London Docklands is a place. 'While location refers to position within a framework of abstract space, often indicated by 'objective' markers such as degrees of longitude and latitude, or distance from another location, place has come to refer to a mixture of 'objective' and 'subjective' facets including location but adding other, more subtle, attributes of the world we inhabit' (Creswell, 2014, 249). Creswell adds that these segments of space can vary in scale, ranging for example from a café or a castle (favourite and famous places) to neighbourhoods and entire cities. The ALCAB report explains:

*Meaning and representation relates to how humans perceive, engage with and form attachments to the world. This might be the everyday meanings that humans attach to places bound up with a sense of identity and belonging. It also extends to ways that meanings of place might be created, such as through place making and marketing. (ALCAB, July 2014)*

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There are two components to meaning, and it is important to recognise both. First, meaning has a personal or subjective dimension. Place is related to other geographical concepts including region and area, which also refer to bounded and changing segments of geographical space (Henderson, 2009). What makes place a distinctive concept, distinguishing it from some other geographical concepts, and particularly space, is meaning, which people attach to it. Humanistic geographers, Yi Fu Tuan and Ted Relph, 'identified place as a subjectively sensed and experienced phenomenon' (Henderson, 2009, p. 539). Tuan explained how people make places by differentiating segments of space, forming attachments to them, and attaching meanings to them. 'We live in space. There is no space for another building on the lot. The Great Plains look spacious. Place is security, space is freedom: we are attached to the one and long for the other. ... Geographers study places. Planners would like to evoke "a sense of place".' (Tuan 1977, 3) This understanding of meaning and of places defined by meaning has since been challenged and developed by Peter Jackson, Doreen Massey and others, who have shown how meanings are grounded in concrete geographies and how meanings are specific to particular groups and identities. Jackson, drawing on Stuart Hall, explains that 'cultures are *maps of meaning* through which the world is made intelligible'; and 'cultures are not simply systems of meaning and value carried around in the head' but are 'made concrete through patterns of social organization' (Jackson, 1989, 2). This means that, though meaning can be understood partly in personal or subjective terms, and framed as perceptions of space, meaning also has a social dimension, and meanings are both shared and contested within and between different communities and societies; places do not have single, unique 'identities'; they are full of internal conflicts. Some but not all members of a community or society share an understanding of a place as beautiful or significant in some way. For example, while the English countryside may be a place of relaxation and beauty to many members of the majority society, it may be a place of work and anxiety for some minorities. Equally, different groups attach different values and meanings to London's Docklands, taking different positions on its past (its 'heritage') and holding different views on its present development and its future.

### Exemplification of core content

To 'explore both the continuity and the changing nature of place and places through empirical data and as perceived by groups and individuals', students must examine two sub-themes, which correspond to the two principal components of place, explained above in terms of localities in which human connections and economic processes are grounded, and the maps of meaning, which distinguish places from spaces. These two themes are formally defined as: '(i) the socio-economic and demographic characteristics, relationships and connections of places; and (ii) the cultural meanings and representations attached to places' (all quotations in this paragraph are from the ALCAB report, July 2014). In practice, these two themes are closely connected. For example, both sub-themes attend to internal and external connections including flows of people, ideas and things, though this is more central to the first of the two themes.

Within this section of the syllabus, students will study at least two places: the place where they live, and one or more contrasting locations. This approach lends itself to both quantitative and qualitative methods of study, and also to fieldwork and individual study. In contrast with the other human geography core theme – Global Systems – this theme should be accessible to classes and individual students, seeking to conduct fieldwork. Their local environments provide

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much scope for fieldwork, which can begin with a range of local studies and explorations (Phillips, 2012).

(i) At A Level, the 'socio-economic and demographic characteristics, relationships and connections of places' are examined through some combination of: 'demography, and cultural difference and diversity; economic and social inequalities; food production, circulation, and consumption' (ALCAB report, July 2014). The first and second of these themes are illustrated through the work of Doreen Massey (1994). Massey's geographical descriptions and reflections – including a vivid critical portrait of a street near her home: Kilburn High Road in London – reveal places that are shaped by cultural, political and economic connections. Through her picture of Kilburn, a place in north London which includes significant communities of Irish and Asian heritage, Massey distilled a more general idea, which has particular relevance to the modern world: a 'global sense of place'.

*Take, for instance, a walk down Kilburn High Road, my local shopping centre. It is a pretty ordinary place, north-west of the centre of London. Under the railway bridge the newspaper stand sells papers from every county of what my neighbours, many of whom come from there, still often call the Irish Free State. The post boxes down the High Road, and many an empty space on a wall, are adorned with the letters IRA. Other available spaces are plastered this week with posters for a special meeting in remembrance: Ten Years after the Hunger Strike. At the local theatre Eamon Morrissey has a one-man show; the National Club has the Wolfe Tones on, and at the Black Lion there's Finnegans Wake. In two shops I notice this week's lottery ticket winners: in one the name is Teresa Gleeson, in the other, Chouman Hassan. Thread your way through the often almost stationary traffic diagonally across the road from the newsstand and there's a shop which as long as I can remember has displayed saris in the window, four life-sized models of Indian women, and reams of cloth. On the door a notice announces a forthcoming concert at Wembley Arena: Anand Miland presents Rekha, life, with Aamir Khan, Salman Khan, Jaha Chawla and Raveena Tandon. On another ad, for the end of the month, is written, 'All Hindus are cordially invited'. In another newsagents I chat with the man who keeps it, a Muslim unutterably depressed by events in the Gulf, silently chafing at having to sell the Sun. Overhead there is always at least one aeroplane - we seem to have on a flight-path to Heathrow and by the time they're over Kilburn you can see them clearly enough to tell the airline and wonder as you struggle with your shopping where they're coming from. Below, the reason the traffic is snarled up (another odd effect of time-space compression!) is in part because this is one of the main entrances to and escape routes from London, the road to Staples Corner and the beginning of the M1 to 'the North'.*

Massey's picture of Kilburn suggests how teachers and students might conduct their own fieldwork: investigating places by walking down local streets where they may observe and record the different connections, and how these are represented and meanings made from them, in their respective local areas (Phillips, 2012; Phillips and Johns, 2012).

The third topic identified by ALCAB, through which A Level students may study the relationships and connections that shape places, is concerned with food production, circulation and consumption. Again, this is highly amenable to fieldwork and individual study. The relationships between food and place are signalled in the subtitle of a study by David Bell and

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Gill Valentine (1997): 'We Are Where We Eat'. Bell and Valentine showed how places are experienced through locally identified produce, eating practices and/or restaurants. Methods for researching the connections and relationships, which shape these food geographies, are exemplified in an accessible research paper (aimed not only at academics, but wider audiences too) which describes a 'supply chain stretching from UK supermarket shelves to a Jamaican farm, and concluding in a North London flat' (Cook 2004, 642).

Though Doreen Massey's and Ian Cook's methods, in these studies, were qualitative, this section of *Changing Places* also lends itself to the use of quantitative data and more systematic survey methods (ALCAB, July 2014). Researchers have investigated, for example, how Christmas celebrations vary by time and place (Danny Miller's *Unwrapping Christmas* illustrates this work). There is scope for A Level students to pursue similar research, drawing upon their own experiences and also upon online quantitative data sources such as the FSA's biannual Food & You consumer surveys and the annual National Diet and Nutrition Surveys. In contrast to this mixed methods approach, the section (of *Changing Places*) on cultural meanings and representations may be more suited to the use of qualitative methods though, once again, both quantitative and qualitative methods are possible.

(iii) At A Level the 'cultural meanings and representations attached to places' are examined through some combination of the following, as specified in the ALCAB report (July 2014): 'place making and marketing, drawing on examples such as regional development agencies, tourist marketing, and property marketing materials; representation of place through photography and film, music and art, literature and poetry, through cartography, census data, statistical representations, digital worlds and geo-spatial technologies such as geographical information systems; lived experience of place in the past and present. Developing understanding of how residents understand and see the places in which they live. These understandings may sometimes contrast with governmental and corporate representations such as those in place marketing or planning documents.' These representations matter in a number of ways, shaping the actions and behaviours of individuals, groups of people, businesses, institutions and governments. For example, they may influence decisions about where to invest in travel or property, or they may be important for people's sense of identity, including attachments to place and identities that may be less directly geographical, but formed in particular places. While some of the examples of geographical meaning and representations, mentioned above, are straightforward, others may be less familiar to geography teachers and students. For example, while documents such as tourist marketing materials and guide books may be commonplace in the geography classroom, the use of imaginative literature such as landscape poetry and travel books may require more introduction (see Sheers 2008). In practice, relatively accessible travel books such as Jonathan Raban's *Old Glory* (about a journey through the Mississippi area) and imaginative works on nature and place such as Robert McFarlane's *The Old Ways: A Journey on Foot* (about relic pathways through the British Isles) may provide good points of departure.

### **Indicative Case Studies and Reading List**

As explained above, A Level students will study place through at least two localities – where they live, and contrasting location(s) – and they will explore selected themes through these localities. Some examples of case studies, through which they may do this, include investigations of 'clone towns', regeneration, how or why some places are rapidly changing

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compared to others, the changing demographics or social make up of a place, and connections within and between places. These examples have formed part of the fieldwork tradition and may be replicated by students in their own field studies.

The ways in which different groups of people may experience and perceive places differently has been examined through a wide range of geographical research, providing ideas for fieldwork at A Level. Examples include the distinctive ways in which people with disabilities experience places, and are sometimes excluded from them, whether through the architecture of the place itself or the codes of behaviour and attitudes that prevail there. Other social groups, who have particular perspectives on place, include homeless people, lesbians and gay men.

Doreen Massey's description of Kilburn High Road, discussed above, illustrates one form this fieldwork might take: qualitative observations of flows, connections and relationships within a locality. There is a long tradition of geographical researchers exploring the places closest to home. A book encouraging local surveys, first published in 1948, might provide inspiration to A Level Geography students, planning studies of their own local places, whether these be overtly diverse or apparently more homogenous, and whether urban or rural. *The School Looks Around* (1948) encouraged students 'to look at the neighbourhood with open eyes, to feel at home in different sections of the community in which they live as school children, as future workers, and as young citizens' and gave suggestions for how they might do this (Phillips, 2012). Local surveys, old and new, explore themes identified by ALCAB for A Level Geography, including 'how residents understand and see the places in which they live' and how their 'understandings may sometimes contrast with governmental and corporate representations such as those in place marketing or planning documents'.

Another example of changing places, which lends itself to A Level fieldwork, involves investigating 'clone towns'. This term was coined in a report, commissioned by the UK Government, which examined the disappearance of local businesses and the rise of chain stores and cafes in what remains of the British high street. Tim Creswell (2008) sums up the experience that this seems to describe, one of homogenisation: 'Everywhere we go we see McDonald's and Starbucks. Even in our homes we see the same kinds and styles of furniture, cutlery, foodstuffs and other produce supplied by the likes of Ikea and Tesco.' This speaks to a number of themes within the Changing Places theme including the ways in which food production, circulation, and consumption defines places, and can be positioned within flows of people, ideas and things. The government report, discussing this issue, is available to download: House of Commons All Party Parliamentary Small Shops Group, High Street 2015, p. 59, available at: [www.tescopoly.org/images//high%20street%20britain%202015.pdf](http://www.tescopoly.org/images//high%20street%20britain%202015.pdf). The examples here are indicative. Rather than replicating them, it may be instructive to learn from them, applying their principles to the design or fieldwork capable of identifying and investigating a wide range of place-related issues.



# Landscape Systems

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## New A Level Subject Content Overview

**Author:** Martin Evans, Professor of Geomorphology, School of Environment, Education and Development, University of Manchester.

*Professor Evans was chair of the ALCAB Geography panel.*

### Introduction

There is a long history of Geomorphology as a key component of physical geography at A level so that the landscape systems core content in the new A-levels is in many ways familiar<sup>1</sup>. Understanding the key landforms and processes of glacial, dryland, or coastal landscapes is central to several previous specifications. Key erosional and depositional landforms and processes in these environments are well covered in existing text books and volumes providing more detailed process understanding are identified in the further reading section of this summary. So what is new in the content to be taught from 2016? The changes relate primarily to conceptual approaches to the understanding of geomorphology which are emphasised more strongly in the new content, which provide clear progression from GCSE and which link to the way Geomorphology is taught in higher education. This introduction to the Landscape Systems content therefore focusses on these key concepts which are applicable to each of the three optional landscape types.

The geomorphological content is specifically framed within a systems context so that students should understand that the physical landscape can be imagined as a series of linked components through which energy and material are cycled. Material is moved by geomorphological processes (e.g. mass movement or transport by ice) between stores. In geomorphological systems these stores are typically landforms (for example a sand dune or a beach deposit). The rates and types of processes controlling movement of material through the landscape vary in time and space creating distinctive sets of landforms. Critically, change in one part of the system can impact on other parts of the system so that landscapes need to be understood as complex interlinked systems. Human management of landscape systems requires an understanding of the linkages and feedbacks within the geomorphological system. Many of the general points about systems and systems theory made in the RGS-IBG 'water and carbon cycle' A Level overview also apply to the landscape content. Excellent introductions to geomorphological systems can be found in Huggett, 2003; Smithson *et al.*, 2008; and Gregory and Lewin, 2014.

### Approaches to Landscape Systems

*Systems framework and sediment budgets*

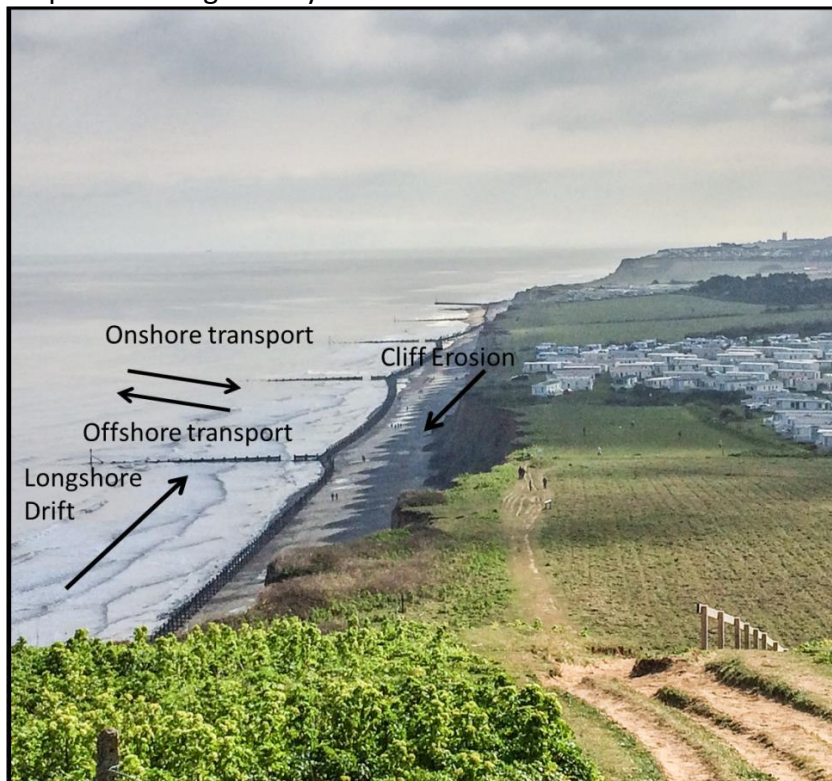
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One common way to conceptualise the geomorphological system is through the idea of a sediment budget represented as:

$$O = I + \Delta S$$

Where O is output of sediment from a system, I is input of sediment to the system and  $\Delta S$  is change in storage within a system.

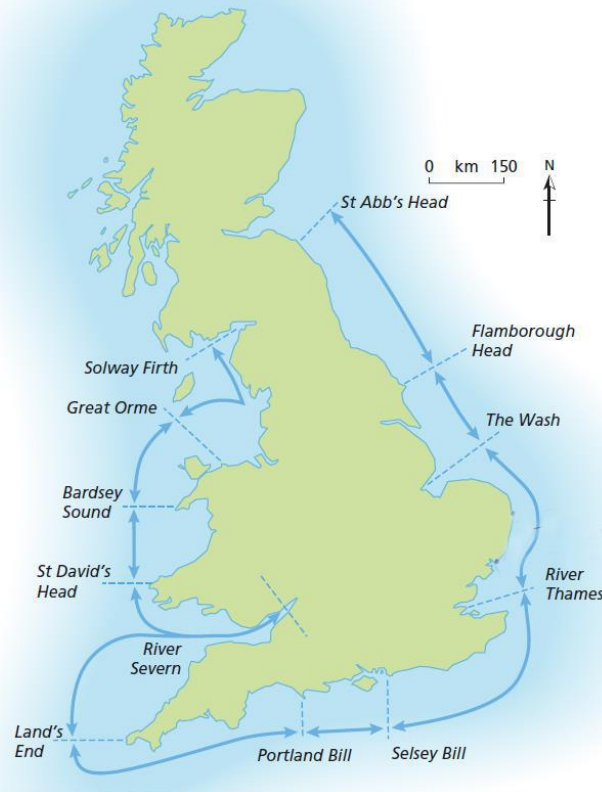
We could apply these ideas to a single landform such as a sand dune. Inputs would be windblown sediment deposited on the stoss slope (upwind) of the dune and outputs would be material eroded from the lee slope. The change in storage is the difference between the input and output. Where it is positive there is net deposition of material and the dune grows. A negative change in storage represents erosion of material from the dune. The sediment budget approach can be expanded from a single landform to look at larger landscape components. For example we could consider a beach system which has multiple inputs and outputs (e.g. figure 1). What the sediment budget approach does is focus on identifying and quantifying the main stores and flows (processes) within the system. In doing so it not only identifies locations in space with net erosion or deposition but develops understanding of why this is the case which is critical for attempts to manage the system.



**Figure 1:** The sediment budget for this beach would have three input terms (longshore drift, cliff erosion, onshore transport) and two output terms (Longshore drift and offshore transport). The groynes built on this eroding stretch of coast aim to minimise losses to longshore drift so that the local sediment budget is positive and the beach accumulates to protect the cliffs. Note that in protecting the cliffs the input from cliff erosion will also reduce (negative feedback) but the overall aim is to produce a positive sediment budget for the beach.

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Coastal management zones around the coast of the UK explicitly consider the sediment budget. Littoral cells are identified as zones where it is assumed that there is no longshore loss of sediment (because of the arrangement of headlands and bays) so that the cell is a discrete source or sink of sediment (figure 2).



**Figure 2:** Coastal sediment cells around the coast of the England and Wales which are used to define the spatial extent of Shoreline Management Plans. Reproduced with permission from *Geography Review* magazine

### *Processes, Landforms, and Landscapes*

The landscapes content emphasises understanding of the range of geomorphological processes which operate within a particular environment and the way in which these combine to create specific landforms. Within a given landscape landforms can be inter-related. Erosion in one location typically leads to deposition in another. The physical controls on an environment such as climate, rock type and tectonic setting vary in space so that characteristic suites of landforms create distinctive landscapes (landform assemblages) which vary across the globe. The optional areas of study for this unit; coasts, glaciated landscapes, and drylands are environments with distinctive process regimes and landform assemblages. However we can also recognise categories of landscape type within these broad groups. A common distinction is between erosional and depositional landscapes. These are spatially defined parts of the landscape system where the sediment budget is dominantly positive (depositional) or negative (erosional). In glaciated systems we recognise the difference between the upland valleys dominated by features such as cirques, and arêtes which are predominantly erosional (Figure 3) and landscapes where depositional forms such as drumlins and moraine are widespread (Figure 4). (See also, Glaciated Landscapes overview available at:

[http://www.rgs.org/NR/rdonlyres/841D9F95-3E42-4A9F-AB1A-01E44B75B95A/0/SCO\\_ALevelOverview\\_GlaciatedLandscapes.pdf](http://www.rgs.org/NR/rdonlyres/841D9F95-3E42-4A9F-AB1A-01E44B75B95A/0/SCO_ALevelOverview_GlaciatedLandscapes.pdf)

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**Figure 3:** *A landscape of glacial erosion, Chamonix, France © Professor Martin Evans*



**Figure 4:** *A landscape of glacial deposition, Wensleydale, Yorkshire, UK © Professor Martin Evans*

Similar distinctions between rocky coasts (erosional) and sandy or muddy coasts (predominantly depositional) and between desert systems dominated by yardang type features (erosional) and dune systems (depositional) apply in other environments (See also, RGS-IBG forthcoming overview on Deserts). Rates of erosion are determined by available energy (wind, wave, or iceflow) and the resistance of the eroding materials (hard or soft rocks). Depositional environments tend to be lower energy but a further critical control is sediment supply, where the production and delivery of sediment exceeds rates of removal deposition occurs. This fact emphasises the geographical linkages between areas of erosion (upwind, upglacier or cliff and river inputs to the coastal zone) and areas of deposition to which eroded sediments are transported. These create natural geographical associations between landscape types so that for example areas of glacial deposition occur down-glacier from areas of upland glacial erosion. The most detailed applications of these notions of characteristic landform assemblages have been in glacial landscapes. Here the idea of the 'landsystem' a characteristic suite of landforms which occur together in space and which have formed under a specific process regime (past of present) has been particularly well developed (see Evans, D.J.A. 2013 further reading). In this scheme suites of landforms associated with particular contexts have been identified. For

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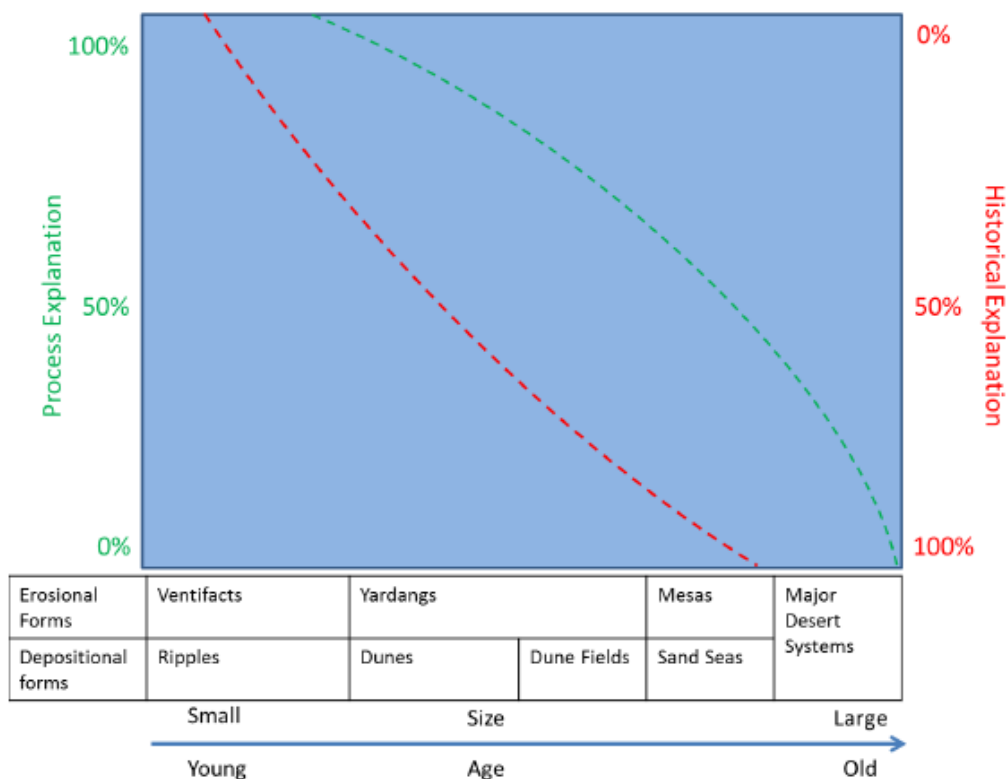
example, the glacial valley 'land system' includes lateral and supraglacial moraine as well as subglacial till and mass movement features associated with bare deglaciated terrain.

Conceptually what is important in this theme is that students understand that particular landform assemblages are characteristic of environments with particular process regimes (past of present). This understanding allows us to both answer the question 'why does this physical landscape look like this?' but also in cases where inherited forms are important answer questions about what the environment was like at this site in the past.

### *Timescales*

As well as understanding the main processes of erosion and deposition in each of the environments, it is important to understand the timescale over which they operate. These can vary from seconds to millennia or longer. In any landscape there are processes which operate at high frequency but low magnitude such as the slow movement of material onshore by small constructive waves occurring on most days. Higher magnitude processes occur less frequently but have a greater instantaneous effect, for example cliff collapse during a storm event.

Because landforms and landscapes are affected by processes operating at a variety of timescales, a complete explanation of a physical system will normally require consideration not just of contemporary processes but also of the history of the system. For example, the ice carved valleys of the Lake District cannot be explained only in terms of current fluvial processes, and the landslide deposits of many Peak District valleys relate to a period of enhanced landslide activity shortly after deglaciation.



**Figure 5:** The relationship between landscape scale and the relative importance of historical and process explanations of the landscape system. After a conceptual diagram first published by Schumm (1985) modified with reference to dryland systems

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Figure 5 is a version of a famous diagram proposed by Schumm (1985) to suggest that smaller and younger features are more significantly controlled by contemporary processes whilst landscape scale explanation increasingly has to consider historical controls on the observed system. This conceptual diagram attempts to reconcile the study of landscapes driven by contemporary processes with the study of landscape history. In order to understand most landforms we need to study both but the relative importance of historical and contemporary influences will vary. In this diagram the red line indicates a potential maximum proportion of historical explanation for features of a given scale and the green line a potential maximum for process explanation. The diagram suggests that the relative importance of the two modes of explanation varies consistently with scale of landform. Large, long lived features have a greater historical component so that for example the existence of major desert systems is a function of the distribution of land masses and global climate circulation and is significantly controlled by long term plate movement whereas the pattern of ripples on a dune is a function of contemporary windspeed and direction interacting with the sand. There may be a small historical component of explanation even here though since the density and calibre of the sand at a point may be related to the geological and geomorphological history of the site.

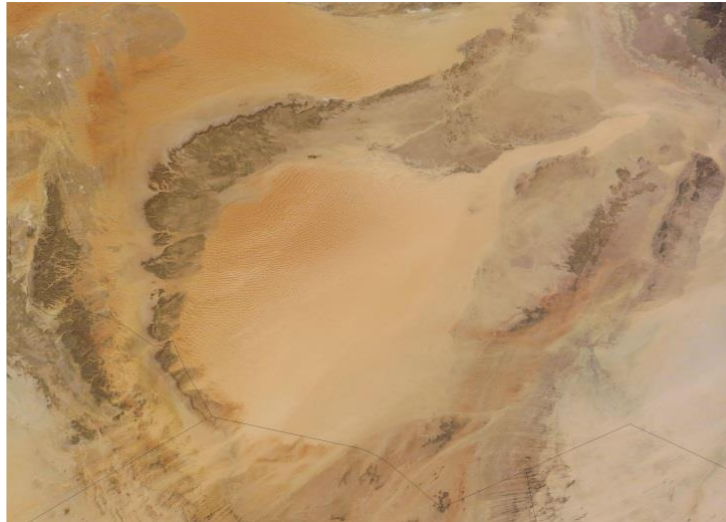
### *Landscape evolution*

It is important that students understand that landscapes evolve over long timescales so that relief can be significantly modified by erosional processes and by tectonic activity. Over these timescales landscapes are also impacted by climate change leading to changes in characteristic process regime and changes in sea level which impact particularly on coastal systems. Larger features require more work to modify or remove and so are longer term features in the landscape. When we study formerly glaciated landscapes the large-scale glacial landforms we study derive from the historical glaciation of the landscape only slightly modified by post glacial activity so that an understanding of glacial history is required to explain the contemporary physical geography.

Because large features persist in the landscape some landforms or landform assemblages can be relict features whose formation has been dominantly influenced by past processes. The most straightforward examples of this are formerly glaciated landscapes. The hanging valleys, cirques and arêtes of upland Britain are explained largely with reference to a previous climatic regime with characteristic weathering and erosion processes during the Quaternary ice ages. Figure 6 shows a similar example from a dryland system. Some landforms can be a result of combinations of process regimes in time to yield unique features. The Tors of upland Britain are usually thought to be a result both of deep weathering of jointed granite in sub-tropical conditions during the Eocene (55-35 mya) and subsequent removal of weathered material by running water and by periglacial activity during the Quaternary period (2mya-present.)

(See also: <http://www.dartmoor.gov.uk/learningabout/lab-printableresources/lab-factsheetshome/lab-torformation> )

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**Figure 6:** shows an example of a sand sea in south eastern Libya. In the North-east corner is a relict river bed. This was dammed by volcanic activity circa 5 mya creating a lake/ Climate change led to desiccation of the lake which became a sediment source for the sand sea <http://earthobservatory.nasa.gov/IOTD/view.php?id=76652>. Image credit Nasa Earth Observatory

### *Human Impacts*

In 2001 Douglas and Lawson estimated that the magnitude of sediment movement by human agency (through construction, landscaping, mining etc.) was circa 57 billion tons, a figure which significantly exceeds the 22 billion tonnes estimated to be moved by all the world's rivers. More recently it has been argued that human beings are now a dominant geomorphological agent on the earth surface (Price *et al.* 2011).

Human modification of the landscape takes many forms, there are direct impacts on the earth surface through construction related fill and excavation and large amounts of sediment are moved through mining operations. This includes deep mining but also exploitation of surface resources which are in themselves landforms such as the mining of eskers and fluvio-glacial deposits for gravel. As technological ability advances various large scale land forming activities have begun in coastal areas. These range from island formation driven by property development in Dubai (figure 7) to construction of islands in the south China sea as part of geopolitical claims (see [http://www.nytimes.com/interactive/2015/07/30/world/asia/what-china-has-been-building-in-the-south-china-sea.html?\\_r=0](http://www.nytimes.com/interactive/2015/07/30/world/asia/what-china-has-been-building-in-the-south-china-sea.html?_r=0))

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**Figure 7:** Extensive construction of artificial islands off the coast of Dubai Public domain image – Tobias Karlhuber

Manipulation of coastal sediment budgets is also a key management approach in terms of coastal defence ranging from groynes to limit sediment loss by longshore drift to active reconstruction of beach defences by replenishment of beach and bar gravels after major storm events (see Holiday, 2014). Human impact on landforms and landscapes also occur indirectly. Human modification of vegetation cover can lead to dramatic erosion (see, UNESCO, <http://www.unesco.org/mab/doc/ekocd/chapter11.html> and RGS-IBG Water and Carbon Cycle A Level overview).

Because the landform assemblages that make up our landscapes are influenced by both contemporary and historical processes there are very few landscapes remaining where there is no significant human impact. There has been a dramatic acceleration of human impact on sediments and landforms in the industrial age so that the magnitude of contemporary processes is such that it may dominate in some locations. In some large urban areas anthropogenic landforms such as canals, cuttings, embankments, and reclaimed land may be the dominant surface features creating a land system where human action is the dominant geomorphological process. For an excellent discussion of human impact on geomorphology see Goudie (2013).

### Fieldwork and Skills

The new A level content specifies that skills and fieldwork should be embedded in content. The Landscape unit is particularly well suited to developing some of these. A key field skill for geomorphologists is observation. So much of geomorphological investigation seeks to answer the question ‘why is this landscape like that?’ The ability to observe landforms in the field, to systematically record those observations and then apply classroom knowledge of the environment and process to explain the genesis of the forms you observe is central. Producing annotated field sketches is a great way to formalise this process, annotating photographs in the field using appropriate apps is another option (see Holmes, 2013).

Of course, in addition to observation fieldwork in physical Geography is a great opportunity to collect data, whether this is till fabric data from drumlins, gravel size data from coastal spits, or sand transport data from sand traps on coastal dunes. The landscape unit therefore offer the



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opportunity to work with that data practising skills such as unit conversion and statistical description of data. Often such data is collected at various points in space so that approaches to mapping data, such as perhaps proportional circles for mean grain size along the spit can be introduced here. Data that is geo-located as it is collected using GPS can be imported into Google earth or simple GIS packages to explore digital approaches to handling geospatial data. Many schools have well established fieldwork that relates to coastal and/or glacial systems. Drylands fieldwork could be more problematic however, the content specifically allows for dryland fieldwork looking at Aeolian processes in this country. So studies of dune form in relation to prevailing winds, or sand transport on coastal dune systems are all possibilities. If you are lucky enough to be able to offer overseas fieldwork there is potential for drylands fieldwork in relatively accessible areas of southern Europe.

### Ideas for Case Studies

Provision of detailed case studies is beyond the scope of this introduction; however three examples below draw on the three core landscape types to illustrate some ways in which empirical material can be drawn upon to develop the themes identified in this article.

#### *Sediment Sources*

Sand dune systems in dryland landscapes require a sufficient source of sandy sediment to maintain the dune field. Without an input of sediment from upwind the dunes will erode away. Common sediment sources are river sands from dryland river systems (e.g. figure 8) or from dried up lake beds. The latter are also an example of the importance of historical processes since lake sediments have been deposited under a previous wetter climate. Useful examples from the Mojave Desert can be found here: <http://pubs.usgs.gov/of/2004/1007/dunes.html>.



**Figure 8:** Sand dunes at Great Sand Dune National Park in Colorado, U.S.A. Rivers draining from the mountains deposit sandy alluvium that is the sediment source for the dunes.

#### *Coastal sediment budgets*

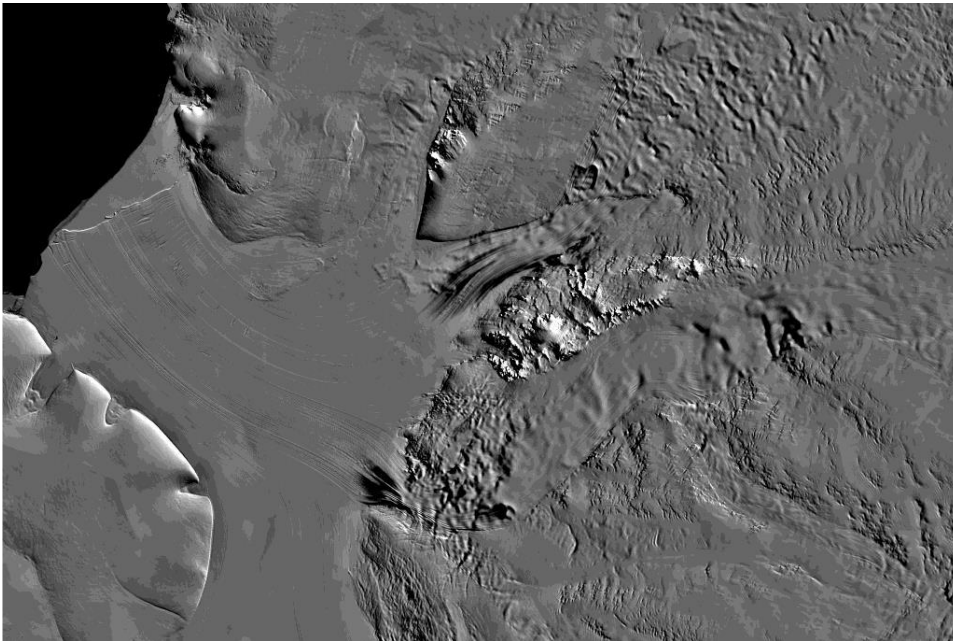
Constructing accurate sediment budgets is a time consuming process which involves measurement and monitoring of the rates all the major sediment transport processes and storage zones. Complete sediment budgets are therefore relatively unusual; however this example of a sediment budget approach to coastal erosion in South Carolina usefully exemplifies the application of the approach in a coastal management context:

<http://pubs.usgs.gov/of/2008/1206/html/processes1.html>

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### *Glacial land systems*

Ice streams are areas of rapid ice flow within ice sheets (figure 9). These are well studied features since they play a significant role in ice sheet mass balance and so in our understanding of the dynamics of past, present and future ice sheets. Ice streams are high energy environments which are able to carry out significant geomorphological work and create distinctive suites of landforms. The short article linked here [www.geos.ed.ac.uk/homes/s0350775/everestetal2005.pdf](http://www.geos.ed.ac.uk/homes/s0350775/everestetal2005.pdf) describes a suite of landforms in the valley of the River Tweed, Scotland and provides an excellent example of the way in which an understanding of this ice stream land system has allowed interpretation of the dynamics of glacial ice over this region in the last ice age.



**Figure 9:** The dark coloured streamlined ice just above the centre of the image is the Recovery ice stream flowing onto the Fisher ice shelf in East Antarctica Imagery from NASA earth observatory <http://earthobservatory.nasa.gov/IOTD/view.php?id=7620>