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A study of the geomorphic and human influence on land resources

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Abstract

Humans have had a significant impact on geomorphology for a very long time, and several people, such as Shaler, McGee, Gilbert, and Marsh, have made important contributions to the field. Nevertheless, throughout the course of the last two decades, concerns over the state of the global environment have brought the function of anthropogeomorphology into clearer focus. As a result of the direct effects of warming, as a consequence of other related climatic changes (such as changes in precipitation), and as a result of climatically moderated changes in major geomorphologically significant variables, global warming, if it happens, will have significant repercussions for a great number of geomorphological processes and phenomena. These repercussions will be important for a number of reasons (e.g. vegetation cover). There are a lot of unknowns when it comes to things like the hydrological response, the frequency of tropical cyclones, the speed and degree of permafrost degradation, the response of glaciers and ice caps, the extent of sea level rise, the reaction of beaches to rising sea levels, and the state of wetlands, deltas, and coral reefs. All of these factors are interconnected with climate change and could have a significant impact on the future. There is a possibility that the consequences of global geomorphological processes will be exacerbated by additional human activities. In light of the fact that so many of the environmental changes are unknown, there is an urgent need to acquire a deeper comprehension of the rates and processes behind the landform response. It is necessary for geomorphologists, among other things, to establish long-term study sites that will generate base-line data, to monitor the location and rate of change using sequential cartographic and remote sensing materials, to determine information on natural background levels and long-term trends by means of data gained from cores, to gain a more profound understanding of the operation of geomorphological systems, particularly with regard to sensitivities and thresholds, and to appreciate how geomorphological systems interact with one another.

Keywords: aeolian, anthropogenic, coastal, cryosphere, fluvial, stratigraphy

Introduction

The field of study known as geomorphology examines landforms and the mechanisms that play a role in their formation. The goal of geomorphology is to understand why landscapes appear the way they do. This includes gaining an understanding of the history and dynamics of landforms as well as predicting future changes by using a mix of field observation, physical experimentation, and numerical modelling. The disciplines of geology, geodesy, geography, archaeology, as well as environmental and civil engineering, all make use of geomorphology in their work. Studies conducted in the first stages of geomorphology provide the basis for pedology, one of the two primary fields of soil science. The development of landforms is caused by a synergistic interaction between natural and human-made processes. Volcanism and tectonic uplift have both contributed to the formation of the terrain. Denudation is caused by processes like as erosion and mass wasting, both of which result in the production of sediment that is then moved over the terrain and deposited either inland or offshore. Subsidence, which may be caused by tectonics or by physical changes in the underlying sedimentary deposits, is another factor that contributes to the lowering of landscapes. The climate, the ecosystem, and the activities of humans each have their own unique effect on these processes. Measurement of the effects of climate change is one of the many practical applications of geomorphology. Other applications include hazard assessments such as landslide prediction and mitigation, river control and restoration, coastal protection, and even assessing whether or not there is water on Mars.

The coastal regime is still a desirable piece of land on the surface of the earth, despite the fact that it is frequently assaulted by the dynamically changing seasonal processes and frequently struck by natural disasters such as cyclones. “This is because the coastal regime always has moisture regimes, agricultural fields that thrive, highly charged natural resources, and beach resorts that are always enjoyable. As a result, the coastal zone has developed into an intriguing region that has to be monitored on a consistent basis in order to ensure the people and the natural resources are adequately safeguarded. The majority of Nigeria's coastline, which extends for a total of 7,500 kilometres, is experiencing ongoing erosion and is being affected by a number of different developments. The impact of a wide array of natural processes may be shown to have resulted in a number of distinct kinds of coastal landforms. These landforms tell a storey in a roundabout way about where they came from and the challenges they've faced since they first took shape. The geomorphic landforms and evolutionary processes on the East coast of Nigeria are distinct from those on the West coast of Nigeria in the coastal area of Nigeria.

The earth is a repository with a plentiful supply of resources. The term resources refers to any stock that may be used in some way by man to satisfy his requirements, such as providing him with a place to live, clothes, and transportation, among other things. Since the beginning of time, man's continued survival has been contingent on the quantity of resources that he is able to extract from his surroundings and put to use. The development of man brought with it a rise in his exploitation of the earth's resources, which in turn brought about a larger degree of disruption to the natural environment. In the vast majority of cases, particularly in more traditional communities, the resources.

Non-renewable resources and renewable resources are the two primary classifications that may be applied to the world's resources. The non-renewable resources are made up of finite masses of materials that develop over long periods of geological time. Some examples of these resources are ore deposits, coal deposits, and petroleum deposits. The term renewable resources refers to those that are abundant but whose supply changes over time. These may then be further broken down into flow resources and continuous resource categories. Continuous resources include of those as well as The term flow resources refers to the materials that are capable of being drained, maintained, or diminished as a result of the actions of humans. They are capable of being renewed with the appropriate management and scheduled utilisation, such as in the case of forests, wild life, soil, surface water, and fishers, to name a few examples. The category of flow resources that includes living things is referred to as Biotic Resources in their aggregate form.

This research focuses mostly on biotic resources since such resources make up the bulk of the total resources found in the Polo Buber region. They were among the first sorts of resources discovered, which led to the development of activities such as hunting, gathering, fishing, and forestry, among many others. A few kilometres separate the polobuber area, which is located in a fresh water swamp catchment basin, from the sandy beaches of the Atlantic Ocean. The use of these resources was limited in the past, and as a result, the natural context gave the impression that it had not been disrupted. They were supplied in an appropriate manner on a seasonal basis, and there was no evidence to suggest that the ecosystem was being stressed beyond what it was capable of bearing.

The richness of these resources drew more people to the region, which, in combination with the population's natural growth, contributed to the rapid expansion in the population. The extraordinary shift in the administration and use of the available resources came about concurrently with the rise in population. However, the environmental pattern of occurrences did not pose a significant barrier to the regeneration of resources or their habitat in any significant way. However, the discovery of oil in the early 1960s ushered in a period of profound and extraordinary transformation. The region has been impacted in a chain reaction fashion as a direct result of oil exploration operations, which led to the appearance of salinized conditions. And over the course of many years, this has led to a significant issue. Therefore, the purpose of environmental management is ...to harmonise and balance the different businesses which man has imposed on natural ecosystems for his own advantage. [Citation needed] The impression of 'benefit,' on the other hand, is contingent on the predominant management vision and goals for a certain environmental feature (such as water, rivers, beaches, or deserts, for example) or location. As a result of these elements, environmental management may be broken down into at least five key dimensions: the significance of location, the implications of size, the situation at a given point in time, the cultural context, and the political framework. Because of these aspects, there is a significant amount of room for social and environmental uncertainty, the majority of which is beyond the purview of this chapter. Instead, we focus largely on the application of talent in order to improve the predictability of environmental modification from a geomorphological point of view. This is our primary area of interest. Geomorphology, which is the study of the origins and evolution of Earth's landforms and the processes that shape them, is clearly a part of the disciplinary scientific basis of environmental management. There has been a long-standing concern with applicable geomorphology, which investigates geomorphological processes and the resulting landforms under the influence of human activity. Geomorphology can be defined as the study of the origins and evolution of Earth's landforms and the processes that shape them. contends that geomorphology has been strongly intertwined with public policy and land use management in the United States from the late 19th century, particularly via the studies that Grove Karl Gilberts carried out for the United States Geological Survey.

increasing opportunity for application

The use of geomorphology in environmental management has progressed both in terms of its content and its presentation manner throughout the course of time. The field of geomorphology

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has continued to grow in terms of its scientific understanding and the tools it offers to its applied scientists, enabling those scientists to become more effective in their efforts to address environmental concerns. To evaluate alternative management scenarios and, as a result, increase the visibility and transparency of geomorphology-centered solutions, there has been an increase in the availability of predictive tools, which frequently originate from GIS-based terrain modelling. This development is particularly noteworthy in this regard. On a social level, environmental managers and the general public have progressively come to understand the significance of geomorphology in the resolution of environmental issues, which has led to an increase in the number of geomorphologists who are involved in the formation of public policy. In tandem with a growing public awareness that environmental conditions are important in determining human quality-of-life, scientific studies of the impacts of humans on ecosystem processes have increasingly highlighted their geomorphological underpinnings. [Citation needed] [Citation needed] [Citation needed] [Citation needed] As a direct result of this, geomorphologists are being challenged to solve an ever-increasing array of issues related to the management of the environment. It is instructive to look at how the contributions of fluvial and coastal geomorphology have developed through time in the context of environmental management in the UK. Geomorphology had no place in the original engineering solutions because those solutions were based on subduing and controlling nature. However, a subsequent shift from hard to soft engineering solutions ushered in what Hooke 5621-Gregory-Chap.indd calls the first phase of geomorphology application. This was based on the recognition that landforms change naturally throughout the lifespan of an engineering project and that projects that disrupted natural geomorphic processes were frequently causing deleterious effects. A second phase occurred once strategic geomorphological questions were asked during the early project planning phases, where local geomorphological baseline information was collected and utilised to answer specific landform questions prior to implementation, and where geomorphologists were actively involved in the project design. This phase lasted until the specific landform questions were answered (and ultimately its appraisal). In Hooke's predicted third phase—which, ten years later, we argue is now the present—the emphasis is placed on our understanding of the conditions that govern geomorphological variability, instability, and equilibrium, as well as the widespread use of enhanced modelling and remote data to predict the effects and the risks of different management scenarios.

Geomorphology, morpho stratigraphy and an Anthropocene

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The term morpho stratigraphical refers to a set of criteria for stratigraphy that is defined by its dependence on geomorphological elements. This indicates that the crucial evidence is provided by the shape of the landform. This is the true, for example, with structures such as displaced shorelines, moraine ridges, or river terraces that depict land-forming activities during a certain time period. Additionally, this is the case with features such as a river delta. In terms of an Anthropocene morphostratigraphy, this should mean that human processes are involved in the formation of a particular landform, and that the human influence should be recognisable from the shape of that landform. Additionally, this should mean that the human processes should be able to be traced back to the formation of the landform. Again, according to the definition, this should imply that landforms that are expressly produced (such as embankments, artificial levées, agricultural terraces, and even ski slopes) are considered to be examples of anthropogenic morphostratigraphic units. Similarly, depositional landforms built to imitate natural features for the purposes of restoration, aesthetic planning, or recreation (such as hills, man-made pleasure beaches) are examples of anthropogenic morphostratigraphic units, despite the fact that it may be more challenging to differentiate them from natural features. Nevertheless, it is feasible that anthropogenic morpho stratigraphy may be used to pinpoint specific time periods. For example, the ridge and furrow landscape of England dates back to the middle ages (about the 5th to 17th century), although part of it was created during the conflicts of the 20th century. As was said before, agricultural terraces serve as a marker for certain phases of landscape transformation in various regions of the globe. The age of the morpho stratigraphical characteristics may also be determined through documentation linked with industrial waste heaps, quarries, open cast mines, and strip mining. This approach has an almost limitless number of applications, with the temporal resolution being defined by the accuracy of the historical, archaeological, or geochronometric date. Because these landforms are exclusive to a geological time span that was impacted by humans, morpho stratigraphy is undeniably an essential component in the argument for the existence of the Anthropocene. However, evidence of human activity is not limited to landforms; rather, it also impacts the elements of sediments and rock that make up landforms, since they too may carry signs of anthropogenic input (for example, the plastiglomerate that is now developing on some Hawaiian beaches). In these instances, which are perhaps best approached from the perspectives of sedimentology, biology, meteorology, or chemistry, the contribution that geomorphology will make will be to clarify how geomorphic processes help to determine the end product, which includes polluted sediments, exotic plant or animal characteristics, and anomalous atmospheric chemical compounds. In Waters et al., a variety of these very diachronic anthropogenic signs are identified, ranging from the extinction of megafaunal species to the presence of radionuclides.

Geomorphological processes, chronostratigraphic evidence and an Anthropocene

It is clear from what has been discussed thus far that our comprehension of the Anthropocene is dependent on the processes that take place on the surface of the earth. Geomorphological processes are essential since they are accountable for the erosion of landscapes as well as the movement of materials to sediment sinks. Although it is easy to make the connection between morphostratigraphy and the Anthropocene epoch by locating landforms that are diagnostic of human activity, it is not always easy to demonstrate that geomorphology is the most important field to study when looking into human-induced changes to the surface of the Earth. This is due to the fact that many landforms are not indicative of human activity, and additional evidence is required to establish that there has been an impact from humans. For example, a river floodplain or delta that was formed as a result of human activity may have a similar appearance to a floodplain that was formed without the influence of humans, but they may be distinguished one from the other in terms of sedimentology, which refers to the lithological and biological evidence that is contained within the sediments that make up the landform. The formation of aeolian dunes in response to the clearing of vegetation for agricultural purposes may result in dunes that are morphologically indistinguishable from dunes that were formed without the influence of humans; therefore, differentiation requires evidence from geochronology and/or historical records.

It is crucial to use a multi-proxy approach to stratigraphy in order to discover human involvement in these circumstances. This is due to the fact that when a lot of proxies coincide, the output of the stratigraphy becomes more trustworthy. The sequences that make up the chronostratigraphic record are produced as a result of geomorphological processes that are either driven or affected by humans. They, in conjunction with the morphostratigraphic units, would comprise what is known as the Anthropogenic Series of an Anthropogenic Epoch. They are, as a result, comparable to stratigraphic units found in other areas of the geological column, and they are quite comparable to the stratigraphic components that form the basis of Quaternary stratigraphy. It should be noted, however, that their chances of survival are rather low, and as a result, they are unlikely to play a substantial role in the evolution of the geological record throughout time. This concern can be addressed by noting that similar evidence, formed by geomorphological processes at the surface of the Earth, has survived throughout the geological column, albeit less frequently than sediments found in oceans or basins. This is an approach that can be taken to address the concern. Despite the fact that this time period is simply the last of many interglacials that occurred during the Quaternary Period, it is important to call attention to the fact that these series are the basis for the classification of the Holocene as a separate epoch. This is brought to the attention of the reader". This is a semantic problem, which is not the focus of geomorphology; the important truth is that human-driven or human-influenced geomorphological processes define an Anthropocene. These processes make up an indisputable portion of the Holocene epoch, despite the fact that they are not reliant on the Holocene's postulated subdivisions in any way. Because of this, geomorphology plays a significant part in the process of determining the stratigraphic components upon which an Anthropocene may be established, both in the here and now and in a long-term stratigraphic record.

Conclusion

Geomorphology examines landforms and the mechanisms that play a role in their formation. Global warming will have significant repercussions for a number of geomorphological processes and phenomena. There is a need to acquire a deeper comprehension of the rates and processes behind the landform response. The development of landforms is caused by a synergistic interaction between natural and human-made processes. Volcanism and tectonic uplift have both contributed to the formation of the terrain. Measurement of the effects of climate change is one of the many practical applications of geomorphology. Man's continued survival has been contingent on the quantity of resources that he is able to extract from his surroundings. The development of man brought with it a rise in his exploitation of the earth's resources, which in turn brought about a larger degree of disruption to the natural environment. Discovery of oil in the 1960s ushered in a period of profound and extraordinary transformation. The region has been impacted in a chain reaction fashion as a direct result of oil exploration operations. We focus largely on the application of talent to improve predictability of environmental modification from a geomorphological point of view. The field of geomorphology has continued to grow in terms of its scientific understanding and the tools it offers to its applied scientists. As a direct result, geomorphologists are being challenged to solve an ever-increasing array of issues related to the management of the environment. In the 1970s, Edward Hooke predicted that the Anthropocene epoch would begin with the

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understanding of the conditions that govern geomorphological variability, instability, and equilibrium. Landforms such as embankments, artificial levées, agricultural terraces, and ski slopes are considered to be examples of anthropogenic morphostratigraphic units. Morphostratigraphy is the study of landforms that are exclusive to a geological time span that was impacted by humans. Evidence of human activity also impacts the elements of sediments and rock that make up landforms. In Waters et al., a variety of anthropogenic signs are identified, ranging from the extinction of megafaunal species to the presence of radionuclides. Aeolian dunes in response to the clearing of vegetation for agricultural purposes may result in dunes morphologically indistinguishable from dunes that were formed without. differentiation requires evidence from geochronology and/or historical records. The sequences that make up the chronostratigraphic record are produced as a result of geomorphological processes driven by humans.

References

1. Alfonso S, Grousset F, Massé L, Tastet J-P. 2001. A European lead isotope signal recorded from 6000 to 300 years BP in coastal marshes (SW France). *Atmospheric Environment* **35**: 3595-3605.
2. Allen JRL. 1987. Toward a quantitative chemostratigraphic model for sediments of late Flandrian age in the Severn Estuary, U.K. *Sedimentary Geology* **53**:73-100.
3. Allen JRL. 2003. An eclectic morphostratigraphic model for the sedimentary response to Holocene sea-level rise in northwest Europe. *Sedimentary Geology* **161**: 31-54.
4. Allen JRL, Haslett S. 2014. Site formation processes in the Severn Estuary Levels. *Annual Report of the Severn Estuary Levels Research Committee* **22**: 3-20.
5. Allen JRL, Rae JE. 1986. Time sequence of metal pollution, Severn Estuary, southwestern UK. *Marine Pollution Bulletin* **17**: 427-431.
6. Ashkenazy Y, Yizhaq H, Tsoar H. 2012. Sand dune mobility under climate change in the Kalahari and Australian deserts. *Climatic Change* **112**: 901-923.
7. Ballais J.-L. 1994. Aeolian activity, desertification and the Green Dam in the Ziban Range, Algeria. In Environmental Change in Drylands: Biogeographical and Geomorphological Perspectives,
8. Millington AC, Pye K (eds). British Geomorphological Research Group Symposia Series, 177-198.
9. Ballantyne CK. 2002. Paraglacial geomorphology. *Quaternary Science Reviews* **21**: 1935-2017.
10. Bateman MD, Godby SP. 2004. Late-Holocene inland dune activity in the UK: a case study from Breckland, East Anglia. *The Holocene* **14**: 579-588.
11. Barchyn TE, Hugenholtz CH. 2013. Dune field reactivation from blowouts: Sevier Desert, UT, USA. *Aeolian Research* **11**: 75-84.
12. Beets DJ, van der Spek AJF. 2000. The Holocene evolution of the barrier and the back-barrier basins of Belgium and the Netherlands as a function of late Weichselian morphology, relative sea-leve rise and sediment supply. *Geologie en Mijnbouw* **79**: 3-16.

13. Benazzouz MT, Boureboune L. 2009. Anthropic actions and desertification in Algeria. In Desertification and Risk Analysis Using High and Medium Resolution Satellite Data, Marini A, Talbi
14. M (eds). NATO Science for Peace and Security Series C – Environmental Security, Springer Science + Business Media BV; 3-18.
15. Berger A, Loutre MF. 2002. An exceptionally long interglacial ahead? *Science* **297**: 1287–1288.
16. Blöthe JH, Korup O. 2013. Millennial lag times in the Himalayan sediment routing system. *Earth and Planetary Science Letters* **382**: 38-46.
17. Blott SJ, Pye K, van der Wal D, Neal A. 2006. Long-term morphological change and its causes in the Mersey Estuary, NW England. *Geomorphology* **81**: 185-206.
18. Blum MD, Roberts HH. 2009. Drowning of the Mississippi Delta due to insufficient sediment supply and global sea-level rise. *Nature Geoscience* **2**: 488–491.