CHAPTER 1

Characteristics of the natural environment

NCEA Level 2 Geography material in this chapter helps to meet the requirements for Achievement Standard 91240 (Geography 2.1) 'Demonstrate geographic understanding of a large natural environment', through understanding of the aspects:

- the characteristics of a large natural environment
- how the elements and processes of a large natural environment interact
- how a large natural environment is formed and changes over time
- how people interact with a large natural environment
- how people's perceptions of a large natural environment change over time.

Choice of a large natural environment

You are only required to study *one* large natural environment. The environment you choose must be large enough to show how the elements and processes interact. Examples of large natural environments in New Zealand are:

- the 'Tongariro Volcanic Centre' – the case study given in this book
- the 'Waitakere Ranges'
- the 'South Island High Country'.

Overseas examples could be:

- the 'Amazon Basin'
- the 'Sahara Desert'.

Location of the chosen large natural environment

The **location** of the large natural environment must be given accurately and you must be able to provide a full explanation of the location. You must use correct terminology. While you may give the **latitude** and **longitude**, you will find it better to draw a map which shows not only the latitude and longitude but also the location of the environment in relation to other physical features such as oceans, mountain ranges and/or fault lines.

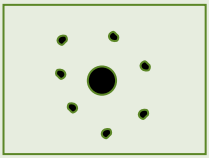
Natural characteristics of the chosen large natural environment

A large natural environment means a distinctive part of the Earth's surface defined by its common natural characteristics (e.g. mountain, desert, forest, river valley) that occurs at a **national**, **regional**, or **continental** scale.

Natural characteristics refer to landforms or **relief**, climate, soils and vegetation. *Characteristics* is plural, and therefore you will need to fully explain more than one characteristic with comprehensive supporting case study evidence integrated throughout the description – when you describe the climate, you must give specific examples of temperature, rainfall and prevailing winds as well as the type of climate such as *temperate* or *tropical*.

Peripheral

Peripheral means 'round the outside'. An example might be of new housing developments on the outskirts of the main core of a city.



Nucleated

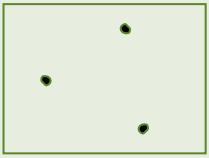
Nucleated features are features that collect round a central point.

A nucleated pattern is formed by houses close to a cross-road.

Dispersed

Elements are widely separated from each other.

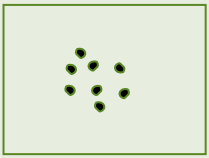
An example might be farms in the South Island high country.



Clustered

The opposite of dispersed. Many of the same elements are concentrated close together, usually around a focus, and there are large areas that contain very few, if any, points.

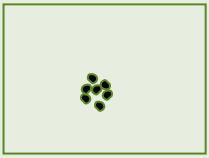
An example would be nightclubs, which cluster together close to a city centre.



Concentrated

Dense arrangement where a large number of features are close together.

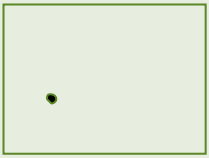
For example, in New Zealand, the distribution of population is concentrated in cities.



Sparse

Few features occur in an area.

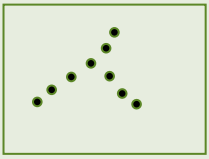
An example would be settlement in a desert area.



Radial

A radial pattern is one that appears to originate from a point.

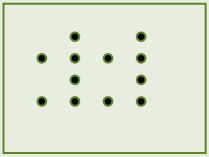
An example would be rivers flowing down from a mountain peak.



Grid

A grid consists of parallel lines.

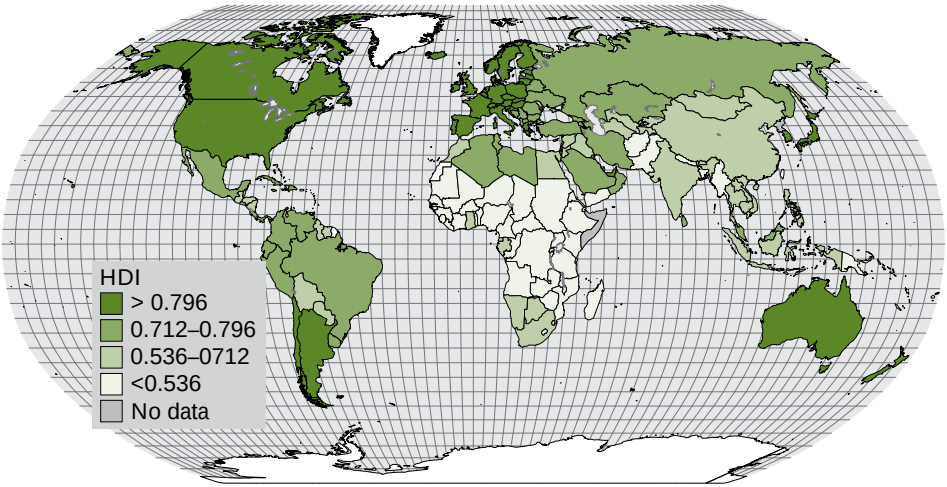
An example would be the pattern of streets in a town.



World map to show HDI by countries

The following map shows the distribution of countries by HDI. Examples of the general trends that can be identified are:

- greatest number of countries with upper range HDI are 'North' countries and countries in the Northern Hemisphere
- greatest number of countries with low HDI are in the continent of Africa and in tropical latitudes.



HDI by countries, 2013

Qualitative or subjective Indicators

Qualitative indicators are people's judgements or perceptions about a subject, e.g.:

- 'How safe is an area?'
- 'How free are people to express their views?'

The answers to questions such as those just mentioned will differ from person to person depending on their circumstances – therefore the answers are considered *subjective*. Qualitative indicators are established by means of surveys of population attitudes, expectations and satisfaction.

Subjective indicators are increasingly becoming important as our understanding of what 'development' means changes. Latest views of development see development as a co-operative process involving the population as well as an emphasis on national development strategies. "Development co-operation" is understood as helping others to help themselves, with the individual being the focal point of the process. How individuals perceive development is therefore very important.

The UN Report on post-2015 development indicators says that 'objective [quantative] data on development can be supplemented by subjective indicators of well-being to provide a fuller picture, for example, regarding inclusive political processes, access to justice, corruption, peace building, equitable social services, victimization, safety and security, health and work satisfaction.' In official statistics, there is growing interest in combining objective with subjective indicators.

Example

A9K8 ▲ *134m*

Beaconed trig station (with trig identification code) ▲ A9K8
Elevation in metres ▲ *134m*

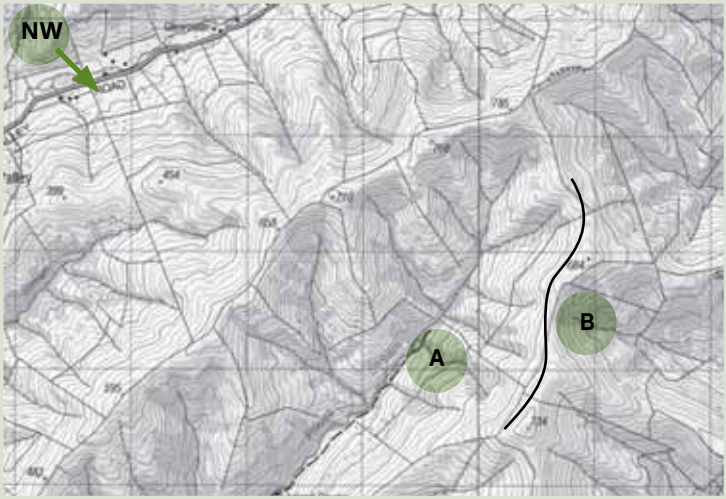
Relief shading helps you visualise the terrain. Hills and valleys are shaded as if they were lit up from the northwest, so the southeast slopes are shaded.

Activity 9D: Map interpretation

Ans p. 247

The extract from a topographic map shows contour lines, spot heights and relief shading.

Use the map to answer the questions.



CHAPTER 11

Conduct guided geographic research

NCEA Level 2 Geography material in this chapter helps to meet the requirements for Achievement Standard 91244 (Geography 2.5) 'Conduct geographic research with guidance', through:

- identifying the aim of the research
- planning the research
- collecting and recording of data relevant to the aim of the research
- presenting, using the correct conventions, a combination of spatial, statistical, and visual data
- explaining findings of the presented data incorporating the relevance of geographic concepts
- providing a conclusion(s) that relates to the aim of the research
- providing an evaluation of the research that describes the strength(s) and/or weakness(es) of the research process and how this affects the validity of the research findings.

Introduction

Achievement Standard 91244 (Geography 2.5) has to be on a research topic which includes information collected from the field, known as **primary data**. You or your teacher will choose the area you will work in, which may be the school environment or a local urban area or may be an area visited on a field trip. At Level 2, the teacher will give you guidance on both the topic and the research methods you can use. You will need to go out and gather information in ways such as measuring, photographing, counting, sketching and/or surveying. You may work in a group to speed up the collection of data. But first, you will need to work out or identify the *aim of the research*.

Students seen here are collecting and recording primary data on a field trip to Tongariro. The teacher is providing guidance on the research process and general information on the landscape and vegetation types.

be tempted to get onto the bridge, but it is not a safe place for them to be. Fences and warning signs are in place, and parents in particular are urged to make their children aware that the bridge is in a dangerous state of disrepair.

The assessment task

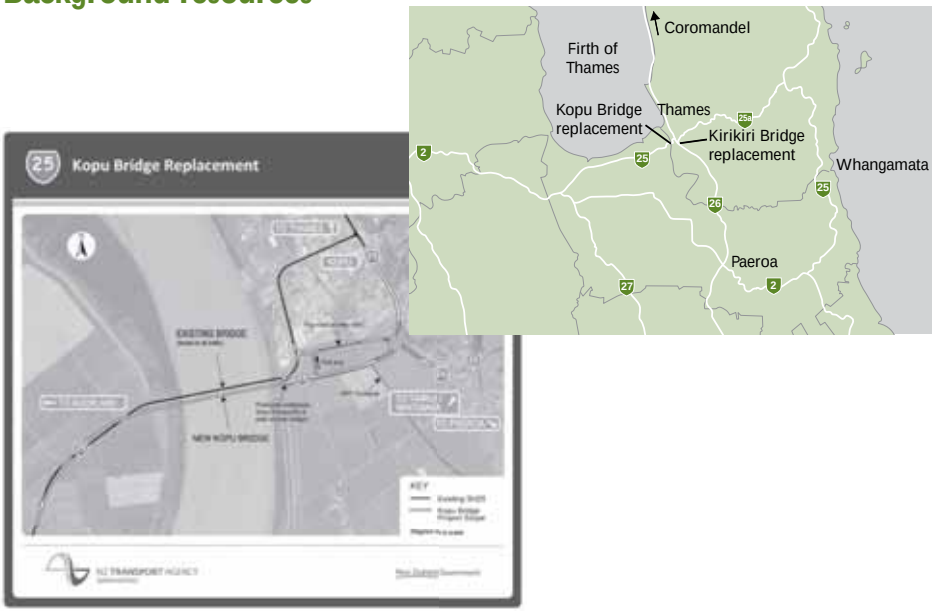
Read the resources that follow, and investigate the issue of: whether to allow the old Kopu bridge to fall into disuse and eventually to demolish it (first course of action); *or* whether to demolish the bridge but save the structure and use some of the bridge in a park (second course of action); *or* whether to save the bridge and open it to the public (third course of action). Fully justify what you think is the best course of action. You should do additional research by going to the following websites.

Internet resources

- NZTA's 'The future of old Kopu Bridge' – see http://www.nzta.govt.nz/projects/kopubridge/future.html
- Stuff.co.nz's 'Saving the old Kopu Bridge' – see http://www.stuff.co.nz/waikato-times/news/8420313/Saving-the-old-Kopu-Bridge
- *Hamilton News* article containing a summary of viewpoints can be found at http://www.hamiltonnewslive.co.nz/news/old-kopu-bridge-keep-it-or-blow-it/1550235/
- NZTA's 'The Kopu Bridge (NZTA Competition)' – see http://www.youtube.com/

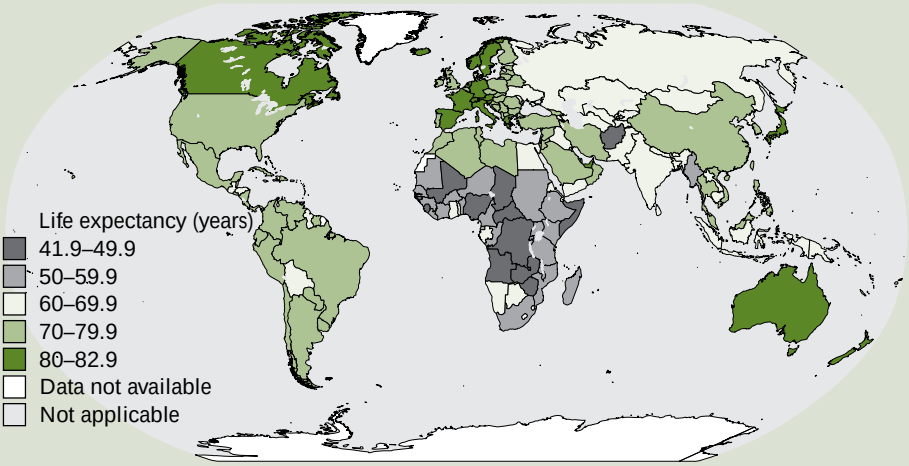
Hotlinks to the previous websites can be found on ▶ **ESA Online**

Background resources

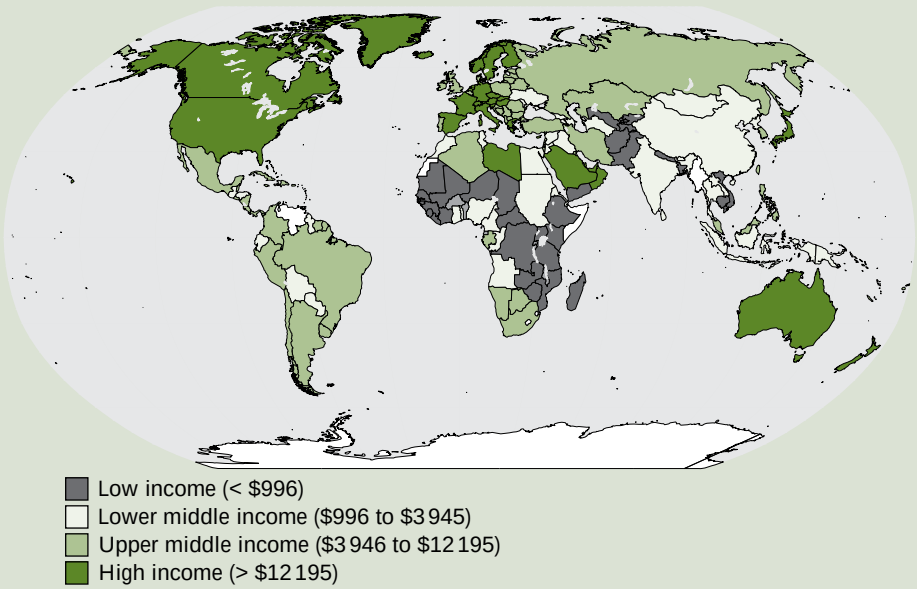


Location of the Old Kopu Bridge

Map of life expectancy at birth 2008



Map of gross national income per capita 2008



Describe the global pattern for each of the preceding world maps, noting the following. You must study the map carefully to identify the pattern. Do not just describe the location. You are identifying the patterns you can see. You must use geographic terminology – such as clustered, random or dispersed patterns.

Presenting your analysis

After you have manipulated the data and analysed it, you are going to present your analysis in the form of a *presentation page*. The presentation page will be your layout(s), accompanied by a written explanation and your recommendation.

Layout

The data used to support the solution to the geographic problem is placed on the layout and may include a map, graph(s), and other visuals such as tables, graphs and images (such as a 3-D screen capture from Google Earth). The layout should follow geographic conventions, and ideally be presented on one page (A3), or several pages that can be viewed together.

'Accurate layout' means the data used to support the solution is presented accurately using appropriate conventions and meets a good mapping standard. Correct conventions must be applied to each part of the layout. Your map layout(s) must use appropriate mapping conventions.

Explanation

In your explanation, present an appropriate solution to the geographic problem that is fully supported by detailed evidence. You need to state clearly the solution to the location problem, referring to your layouts and screen captures on your presentation page and including specific details in your answer.

When planning the layout, make sure the manipulations and presented spatial data follow in a logical sequence to support problem solving.

You need to show that you have completed the assessment task yourself. It is wise to produce a task or record sheet (see following) that shows the various steps in the problem-solving process you have followed and that the steps have been sighted by your teacher who has signed and dated your work to verify its authenticity.

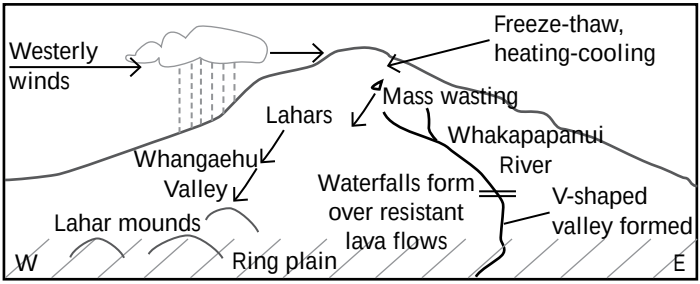
Verification of GIS skills – Record sheet	
Task	Teacher sighted (sign and date)
Data collected	

The solution to the geographic problem

You need to propose a solution to the geographic problem and you must fully justify the solution. This means you must refer to alternative solutions. This means you need to say why the proposed solution is the best and better than any alternative solutions that can be envisaged. For example, in solving a geographic problem of 'Finding the best place to build a new school', when saying which you consider to be the best site for a school, you would need to say why you have rejected all the other sites which may be possible solutions to the geographic problem. However, whether the depth of the justification focuses on the solution or on the alternatives will be determined by the nature of the geographic problem.

Activity 2J: Erosion, transportation, deposition and other erosion processes (page 36)

Erosion, transportation, deposition and other erosion processes



Activity 2K: Changes due to tectonic, climatic and surface processes (page 37)

1.

	Tectonic processes	Climatic processes	Surface processes
Main changes resulting from these processes	Tectonic processes have caused subduction and faulting, resulting in magma pools 70 km below the surface. These in turn result in volcanic action; the eruptions have caused volcanic cones (e.g. Tongariro and ring plains).	Climatic processes break down rocks by freeze-thaw, oxidation, and exfoliation. Rocks disintegrate into smaller pieces which are then more easily removed by erosional processes. Wind/aeolian processes remove loose soils on the high, exposed slopes of Ruapehu, Tongariro and Ngauruhoe. Glaciation from the last ice age has left U-shaped valleys and moraines – as seen in the Mangatepopo Valley.	Mass wasting moves loose material downhill due to gravity – seen in the solifluction cusps on the steep slopes of Ruapehu. Mass wasting causes landslips or landslides due to gravity. Fluvial action (e.g. Whakapapanui River) has carved steep V-shaped valleys into the unconsolidated materials of the cones.

2. There is no right answer – it is how you justify your decision giving case study material to support your argument that is important. *A suggested answer follows.*

Tectonic action is the most important process, for, if New Zealand did not lie on a plate boundary between the Pacific and Australian plates, there would be no subduction, no magma pool and no volcanic action. For it is plate tectonics which is the main cause of volcanism that has resulted in the volcanic cones such as Ruapehu (which reaches 2 797 m in height). Climatic processes have an effect in changing the environment (especially glaciation, which has created deep U-shaped valleys and moraines), but tectonic and volcanic processes act at a greater scale. The least of the processes is the surface processes, for they act more slowly in wearing away the cones which volcanism continues to build.

contour interval (136) spacing of contour lines; chosen depending on the topography.
contours (136) lines joining equal height above sea level.
convection currents (24) molten rock from the Earth's interior moves towards the surface, where it cools and returns to the core, in a circular motion.
correlation (87) a relationship between two variables.
crater (13) a bowl-shaped geological formation at the top of a volcano.
cross-section (139) diagram that shows the height and shape of land using the pattern of the contours on a map; allows land to be viewed in profile.
crust (24) the outer surface layer of the Earth, between 3 and 35 km deep; large sections of the crust are known as *plates*.
cultural environment (173) the man-made environment – including urban and rural cultural landscapes, buildings and infrastructure; the cultural landscape is created by humans, and is not part of a 'natural' environment.
cultural factors (81) attitudes, ways, traditions, practices, laws, policies, systems and beliefs of people that can contribute positively or negatively to the scale and rate of development; unlike natural factors, cultural factors can be more easily managed and changed.

decentralisation (63) process of movement away from the centre of a city.
demographic indicators (88) measurements to do with population, such as total population, ratios of age structure.
denudation (28) long-term process of the wearing away of the Earth's surface leading to a reduction in relief and elevation.
dependants (88) people who rely on others for support; usually non-workers such as children below the age of 15 and adults over the age of 65.
desertification (80) the process by which fertile land becomes desert, typically as a result of drought, deforestation, or inappropriate agriculture.
developed countries (79) countries with a high level of industrial, manufacturing, technical and social development; fully use their resources.
developing countries (79) countries that are attempting to achieve development.
development (79) a combination of economic wealth and social well-being and quality of life.
dispersed (53) spread apart.
dot distribution graph/map (167) a map type that uses a dot symbol to show the presence of a feature or phenomenon; relies on a visual scatter to show spatial pattern.
drumlin (31) a low, oval mound or small hill, typically one of a group, consisting of compacted boulder clay moulded by past glacial action.

eastings (132) vertical lines on a topographical map; their values are represented at the top and/or bottom of the map; used with northings, can create grid references of locations and objects.
economic (39) phenomena (things)/processes/viewpoints related to money, income, costs, profit, employment, etc.
economic development (82) generally refers to the sustained, concerted actions of policy makers and communities that promote the standard of living and economic health of a specific area – such as improving manufacturing and technology, etc. within a country to increase export income and/or reduce debt.
elements (2) parts or aspects of something.
environment (2) a distinctive part of the Earth's surface defined by its common characteristics.
erosion (6) the general term used to describe the wearing down and subsequent transportation of the Earth's surface.