



Regional Conference, Kiama 2019

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Syllabus links

Topic: Environmental Change and Management – Stage 5

Geographical Concepts: Place, space, environment, change, interconnection

Geographical Tools: Topographic map, land use map, sketch map, photographs, fieldwork

Key Inquiry Question:

How does the function and management of the Minnamurra River environment change from source to sea?

Geographical Inquiry Skills

- Acquiring geographical information
Students collect, select, record and organise relevant data and geographical information, using ethical protocols, from a variety of appropriate primary data and secondary information sources
- Communicating geographical information
Students present findings, arguments and explanations in a range of appropriate communication forms reflect on and evaluate the findings

Expected Learning

Students

- Understand the functioning of natural environments
- Understand the impact of human changes along a river profile
- Investigate different management approaches along a river profile
- Use a spatial technology tool to communicate geographical information

Assessment

- Students create a post fieldwork Google Tour of the Minnamurra River to communicate fieldwork findings

SEE APPENDIX 2 –
Fieldwork Data Collection sheets in PDF and Word formats.

Pre-Fieldwork Activities

Teacher conducts an introductory lesson on the long profile of the Minnamurra River (from source to mouth) using explicit teaching and activities to outline how the function (role, processes, behaviour and uses) of a river changes from the upper to middle and lower courses.

<http://www.alevelgeography.com/the-long-profile/>

Students complete a mapping exercise using a topographic map to create a land use or precis map of the land surrounding the river course. They use colours symbols or shading to identify national park, agricultural land, urban areas, recreational areas.

Note: Use topographic maps printed from six maps to create a long profile of the river. <https://maps.six.nsw.gov.au/>.

Note: Students could also create a model of the river profile.

Fieldwork Activities

Fieldwork equipment required e.g. clipboard, maps, data collection sheets and / or apps, turbidity tube, anemometer, thermometer, phone/camera, tennis ball, tape measure and stopwatch.

1. Minnamurra Rainforest

At this location teachers may wish to discuss the gradient of the river in the upper course, the presence of only bare rock or large boulders in the riverbed (a result of river velocity), as well as the role of the rainforest in keeping water temps cool. Walk to top of falls to get as close to the source as possible. Above this, the river originates from a swampy spring on the top of the escarpment. Here the river helps support the rainforest and the channel is quite narrow. This is the most heavily managed area of the river and vital to the health of all ecosystems downstream. What sort of management can you identify?

2. Swamp Road – farming

At this location the river has passed through the village of Jamberoo (population around 1700) and several working dairy farms (some of which allow cattle direct access to the river). Note the changing gradient of the river and how this has affected the channel width and the velocity of the river. Run-off from agriculture may lead to an increase in phosphates and nitrates in the river, these can lead to excess nutrients in the water and algal blooms (Note if there are any visible algal blooms. If not, it may be a sign of effective management). Management strategies at this location include signage, fencing to

restrict cattle access to the river as well as a well-maintained riparian zone that helps stabilise the bank and reduce erosion.

3. Estuary – mudflats

At this location, teachers may wish to discuss the sediment that has travelled from upstream to create the mudflats, the breadth of the river and biodiversity throughout the estuary. Here, there are opportunities to point out management processes such as the boat ramp, walking bridge, signage, recycling station for fishing wire and fencing.

4. River mouth at Minnamurra

Climb the headland from James Oats Reserve to the Minnamurra Lookout to get a great view of the Minnamurra river estuary. Students take a final photograph to add to their Google tour or complete an annotated field sketch. No are water measurements are completed here but this stop makes a good bookend for the day to complete the river profile. discuss longshore drift and deposition here as well.



Photo: Minnamurra Estuary. Source: <https://www.visitnsw.com/destinations/south-coast/kiama-area/kiama/destination-information/minnamurra>

Students

- Measure water temperature
- Measure turbidity
- Measure flow rate
- Take photographs
- Observe- land use, biodiversity, management practices
- Complete the data record sheets

Data Collection Sheets – SEE APPENDIX 2a & 2b (Word document) and (PDF)

Assessment / Post-Fieldwork Activity

Create a Google Tour of the Minnamurra River

For each of the four locations visited during fieldwork add the following information to create a Google Tour

- Describe the features and characteristics of the river and surrounding environment using the data collected at each location.
- Identify the different uses of the river at this location e.g. agricultural, recreational, urban
- Identify and describe the management strategies evident and suggest the purpose of each strategy.

Google Tour Builder –

<https://tourbuilder.withgoogle.com>



Source: https://upload.wikimedia.org/wikipedia/commons/5/5a/Minnamurra_NSW_2533%2C_Australia_-_panoramio.jpg

Assessment Marking Guidelines

Data collection and communication

A	Clearly and accurately describes the features and characteristics at each location Effectively incorporates all data collected into a relevant and detailed description Demonstrates accurate collection of fieldwork data
B	Clearly describes features and characteristics at each location Incorporates data collected into a relevant description Demonstrates accurate collection of fieldwork data
C	Sketches in general the characteristics at each location Incorporates some of the data collected into a general description Demonstrates a satisfactory level of accuracy in fieldwork data collection
D	Identifies some features at each location

Using a spatial technology tool

A	Demonstrates high level of competency in using a spatial technology tool to communicate geographical information
B	Demonstrates competency in using a spatial technology tool to communicate geographical information
C	Developing competency in using a spatial technology tool to communicate information
D	Developing skills in using a spatial technology tools



Screen capture: Minnamurra River from Google Earth. L. Chaffer 2019