

THE WORKSHOPS RAIL MUSEUM

EDUCATION ON TRACK

SUGARCANE, CATTLE AND COAL – RAIL TRANSPORTATION AND INDUSTRY



Purpose

This program of work aims to provide opportunities to explore the industries of Central Queensland through the theme of rail transport. Students will be able to develop an understanding of the importance of different industries as well as the impact that changes in rail had on the development of an industry.

The primary objectives of the program are for students to gain an understanding of:

- The history of the sugarcane, cattle and coal industries
- The impact that rail had on these industries both before and after the introduction of diesel engines.
- How industrial development impacts on their local area

Activities in the program assist students to develop their understanding while developing their literacy skills and ability to navigate websites to find information.

Students are provided with primary and secondary railway resources including:

- Photographs
- Maps
- Timelines

Key concepts

The development of rail in Queensland allowed for the growth and development of new industries. In Central Queensland, the livelihoods of many people are dependent on the success of the sugarcane, cattle and coal industries. Without rail, those industries would never have developed to the extent to which they exist today. The changes in the rail industry have also had a flow on effect to the agricultural industries. Specifically, the development of diesel engines allowed for a greater amount of freight to be moved at a much quicker rate. This meant that industries could supply more products and be assured of its transport and delivery.

QR (Queensland Rail) has always provided a service to these industries; however, they have also been a central factor for the growth of these industries. Without the railways, these industries would not be as successful as they are today.

Learning outcomes

SOSE	TCC 4.1	Students use primary sources to investigate situations before and after a change in Australian or global settings.
SOSE	TCC 4.3	Students share empathetic responses to contributions that diverse individuals and groups have made to Australian or global history.
SOSE	TCC 4.4	Students critique information sources to show the positive and negative effects of a change or continuity on different groups.
SOSE	TCC 4.5	Students review and interpret heritages from diverse perspectives to create a preferred future scenario about a global issue.
SOSE	TCC D4.7	Students represent eras of past civilisations on a timeline or chart.
English	CU 4.1 OP 4.1 CR 4.1 CU 4.2 OP 4.2 CR 4.2 CU 4.3 OP 4.3 CR 4.3	Students interpret and construct texts, from a range of generic categories that explore familiar and unfamiliar subject matter, by considering text type, purposes, implied meanings, and known and unknown audiences. They identify and use a range of textual resources that structure texts, extend and elaborate ideas and information, and express opinions. They explore how particular representations appeal to certain groups.

Program outline:**Total Time:** 10 weeks**Previous Knowledge:** knowledge of the local area.**Description:**

- Pre visit
 - Students are introduced to the concept of agricultural industries and discuss the types of industries within the local area.
 - Students brainstorm and discuss the purpose of rail and the importance of rail in Queensland.
 - Students complete the history and geography activities.
 - Students work their way through the sugarcane, cattle and coal information and associated activities.
 - Students participate in discussions about the information and activities.
- Visit to The Workshops Rail Museum
 - Students participate in an introductory session with Education Officer
 - Students move through the Museum and complete activity book
 - Students participate in a question and answer session with Education Officer
- Post visit
 - Students use the information and experiences to complete suggested assessment tasks.

Students use class discussion to critically reflect on the assessment tasks and to exchange ideas regarding assessment.

Support materials and references

For Queensland Rail History:

http://www.history.qr.com.au/the_history/section1/default.asp

To obtain information regarding loans kits (for classroom use of early Australian and rail related artefacts and resources) access the Queensland Museum website:

<http://www.qmuseum.qld.gov.au/education/loans/country.asp>

For a Queensland Rail Education Officer to attend your school for a Community Education Talk contact QR on (07) 3235 1624 or log on to www.qr.com.au for further details.

Book References

Mitchell, K & Cope, G. (1986) *Queensland Coal Lines '86*. Australian Railway Historical Society Queensland Division: Brisbane.

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Queensland Railways. (1971) *Commemorating opening of Goonyella Line, 5th November, 1971*. Journalistic & Photographic Sections Queensland Railways, Screen Offset Printing: Brisbane.

Website References

BHP Billiton (2005) BHP Billiton Sustainability Report 2005.

<http://hsecreport.bhpbilliton.com/2005/docs/repository/aboutReport/BHPBillitonLocationsMap.pdf#search=%22Coal%20mining%20locations%20Australia%20%22> Available: 26/10/06.

Centennial Coal Company Limited (2006) Mine Locations – Mining Operations and Community Information.

<http://www.centennialcoal.com.au/ssl/axs/1/11.asp?seclD=4> Available: 26/10/06.

Commonwealth of Australia (2006) National Land & Water Resources Audit Australian Natural Resources Atlas V2.0. http://audit.ea.gov.au/anra/agriculture/docs/national/Agriculture_Profile.html Available: 26/10/06.

QRNational– National Rail Freight and Logistic Services (2006) Freight – Coal.

http://www.freight.qr.com.au/freight_services/coal/coal.asp Available: 26/10/06.

Queensland Farmers Federation (31/8/2005) About Farming, **Chapter 11 – Sugar**.

<http://www.qff.org.au/farming.asp?dbid=16> Available: 26/10/06.

Queensland Sugar Limited (2002) The Queensland Sugar Industry.

<http://www.queenslandsugar.com/page.cfm> Available: 26/10/06.

Zelmer, L (1999) Queensland's Cane Railways—An Introduction.

http://zelmeroz.com/archives/1998/ng_cane/QCane99.pdf#search=%22history%20of%20sugar%20cane%20farming%20in%20Queensland%22 Available: 6/10/06.

History of Agriculture and Industry in Australia Timeline

Each member of the class is to choose a specific date and event and;

- Write that date on the top of a piece of A4 paper
- Write down the facts that occurred on that date in large clear writing
- Draw a picture that represents the facts
- Hang the pictures in order around the room
- Discuss the timeline as a class
- Note: Sugarcane points are in normal font, cattle points are in italicised font and coal points are in bold font

Time line

1788 – Sugarcane introduced to Australia by the First Fleet

1788 – Cattle arrived with the First Fleet and were key food and milk providers for the early settlers

1791 – William Bryant discovers coal in NSW

1801 – First coal mining settlement established at Hunter River

1820 – Coal found in Queensland near Ipswich

1825 to 1826 – Importation of Shorthorn and Hereford cattle breeds allow the cattle industry to move to Queensland

1843 – Coal mine opened in Redbank

1850 to 1860 – Coal used mainly by rail and steamships

1860 – A viable sugarcane plantation and raw sugar mill is established at Ormiston, near Brisbane by Captain Louis Hope

1860 to 1890 – Cane lands developed along the Queensland tropical coast and cheap labour is imported from South Pacific Islands. Some were kidnapped from their homes and used as slave labour.

1880 – First beef exports to London from Australia

1888 – Annual coal production has reached 2.5 million tonnes in Queensland and New South Wales

1890 to 1950 – Beef trade with the UK continues to grow steadily

1908 – New laws controlled the recruitment of South Sea Islander labourers and many returned home.

1910 to 1940 – European migrants replaced South Sea Islanders as the main source of labour in the fields.

1939 to 1945 – Coal demand increases due to the increased use of electricity

1950 to 1960 – Coking coal that is used to make steel is exported to Japan

1954 – Bulk handling of raw sugar is introduced and mechanical harvesters begin to replace manual labour in the fields

1955 – The United States replaces the UK as Australia's dominant beef export market

1960 – 85% of cane crops are harvested manually.

1960 to present – Oil becomes the worlds most used primary energy source. However, low cost and high availability make coal the most common source of electricity.

1970 – 100% of cane crops are harvested manually

1970 to 1983 – Economic and environmental factors (oil prices and drought) see a massive decrease in the beef industry.

1980 to present – The industry continues to grow and as tariffs are reduced more sugar is exported internationally

1990 – Asia replaces the United States as Australia's dominant beef export market

Geography of Agriculture and Industry in Australia Mapping Activity

Australia's wide and varied geography means that different types of agriculture and industries do well in specific areas. For example, coal industries are based in areas where coal has naturally formed through geographical processes and sugar cane is grown in areas with the correct climate for maximum yields.

Use the information from the various maps included and an atlas to complete the following activities on the Australian map handout;

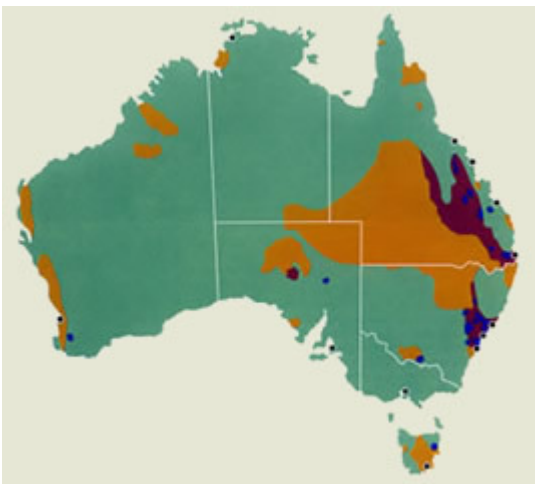
- Identify areas where coal is produced and colour them brown
- Identify areas where cane sugar is grown and colour them green
- Identify areas of cattle farm land and colour them red
- Mark these major cities using a black dot and print their names on the map;
 - Canberra
 - Brisbane
 - Sydney
 - Adelaide
 - Perth
 - Hobart
 - Darwin
 - Melbourne
 - Townsville
 - Cairns
 - Rockhampton
 - Mt Isa
 - Emerald
 - Moranbah
 - Alice Springs
- Mark the Tropic of Capricorn on the map using a dotted line
- Draw a key on the side of the map indicating what the colours on your map represent



Energy Coal

Ref	Country	Site/Asset	Description	Ownership
65	Australia	Hunter Valley Energy Coal	Mt Arthur Coal	100%
66	Australia	Illawarra Coal	Marketing agent for energy coal output	-
67	Australia	Queensland Coal	Marketing agent for energy coal output	-
68	Colombia	Cerrejón	Largest coal producer in Colombia	33.3%
69	Indonesia	PT Arutmin	Exclusive agent for coal output	-
70	South Africa	Ingwe	Largest coal producer in South Africa	100%
71	US	New Mexico Coal	Mine-mouth operations	100%

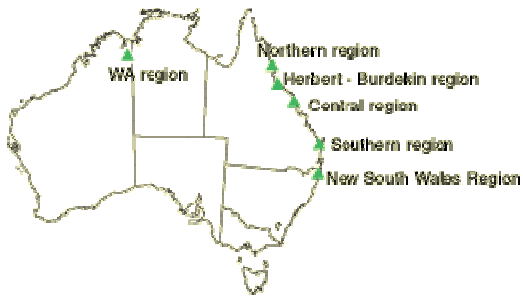
Image courtesy of BHP Billiton



Black Coal Resources

- Producing areas
- Substantial economic resources
- Known coal areas

Image courtesy of Centennial Coal



Cane growing regions of Australia

Image Courtesy of Australian Natural Resources Atlas V2.0.

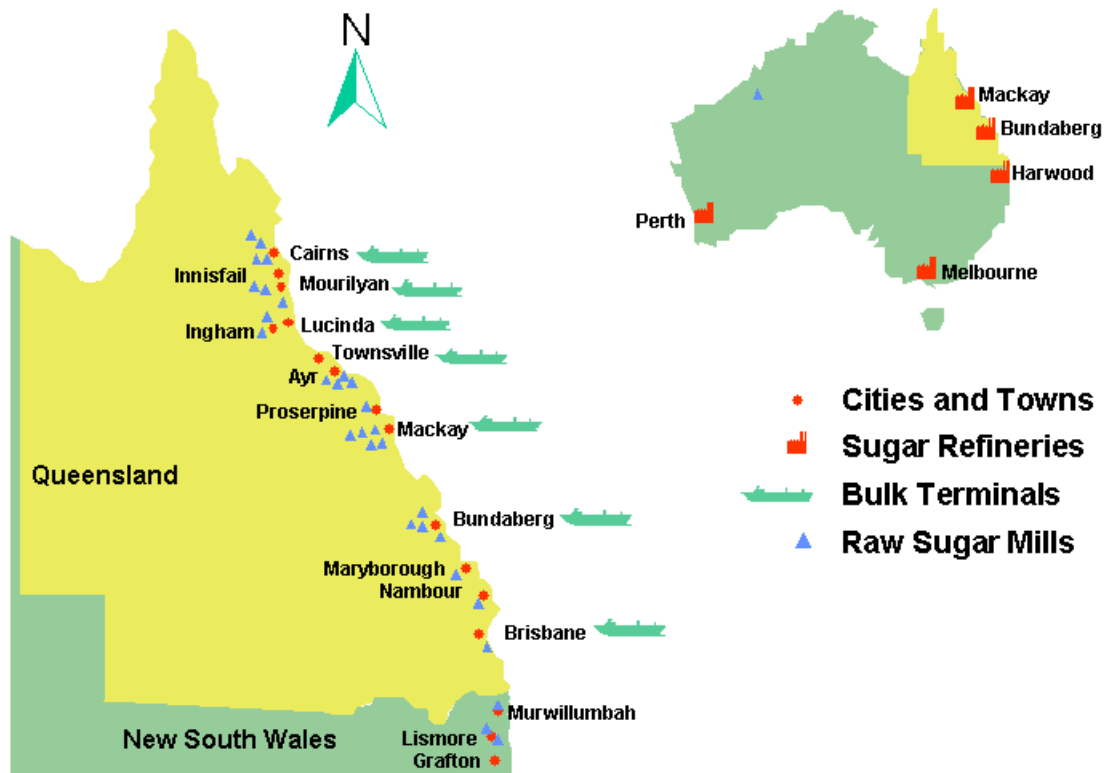
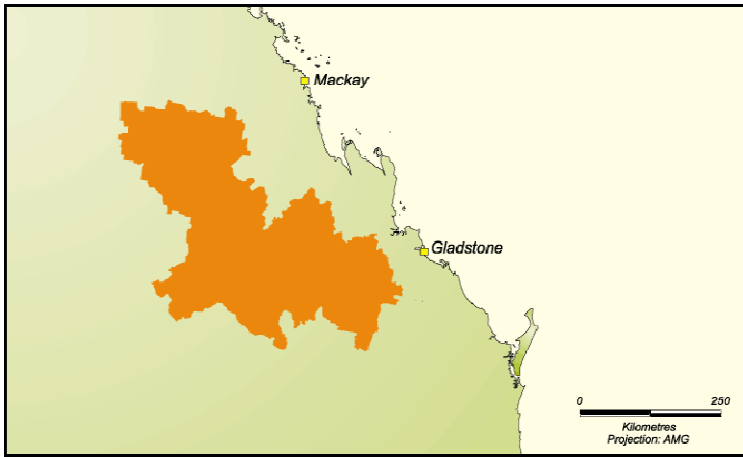
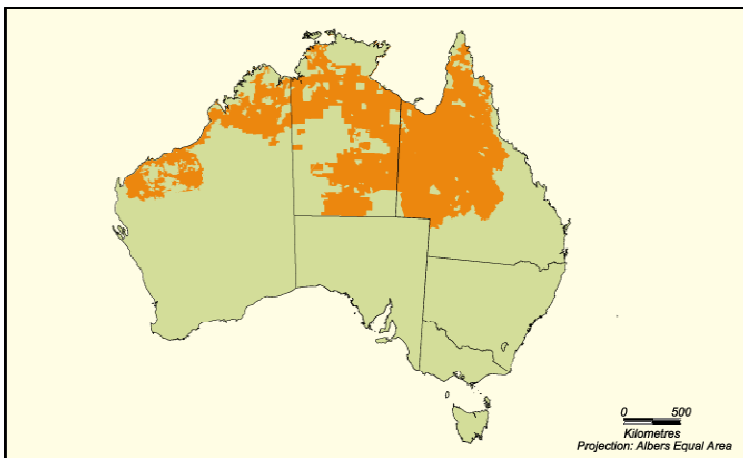


Image Courtesy of Queensland Sugar Limited

Beef - Northern Temperate Zone



Beef - Northern Pastoral Zone



Beef - Southern Pastoral Zone

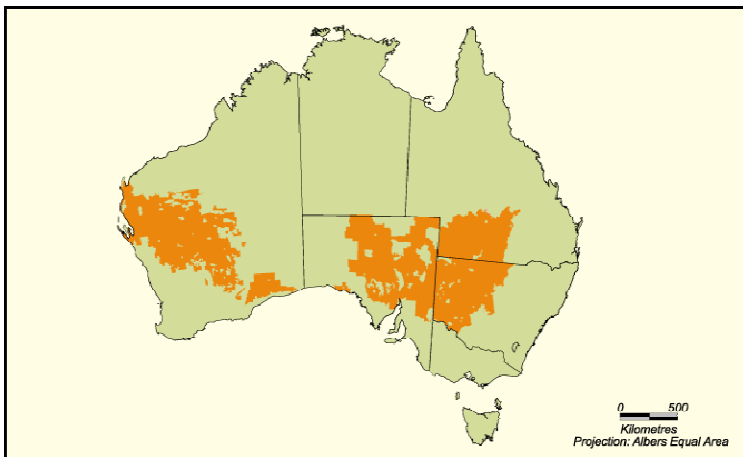
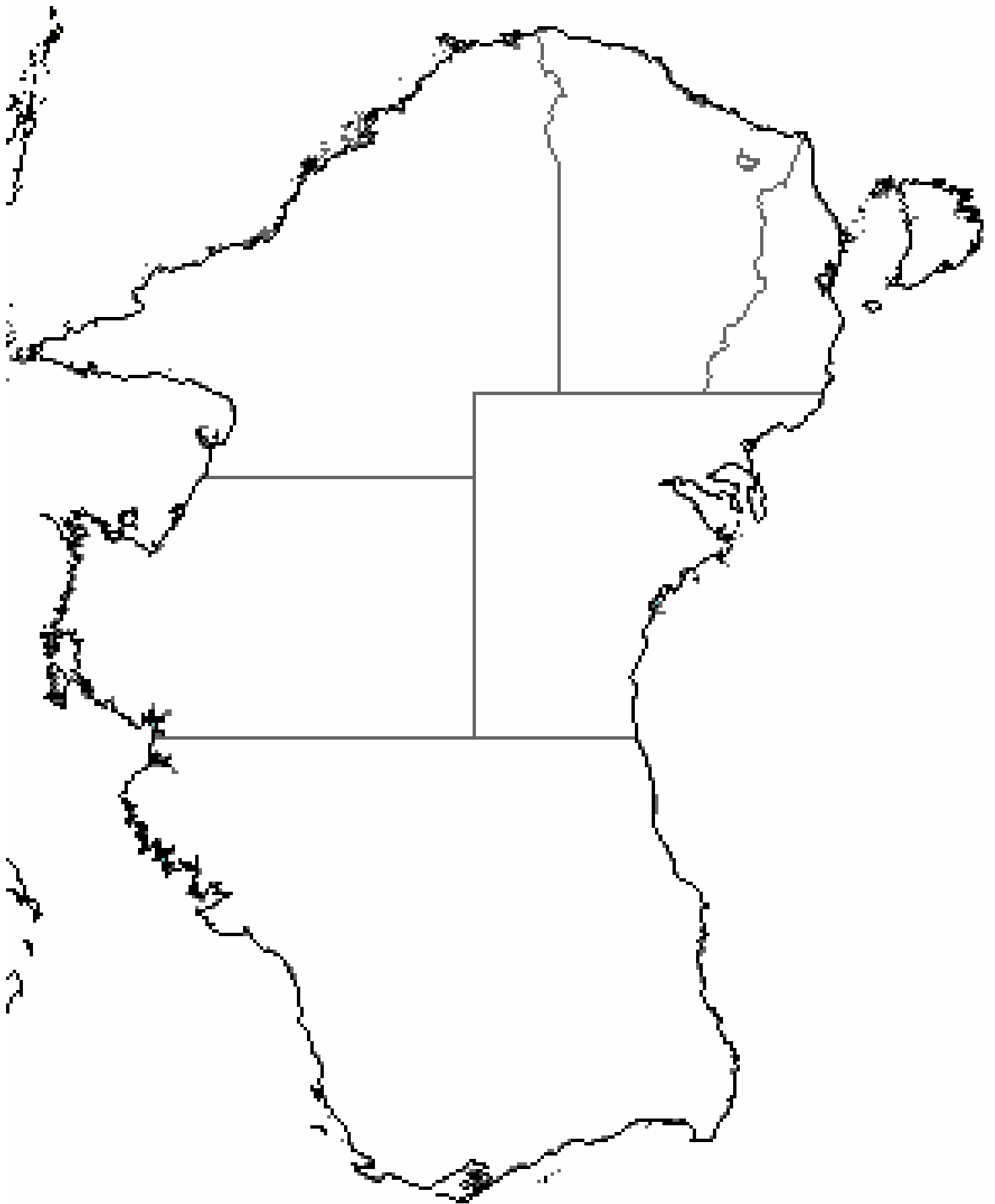


Image Courtesy of Image Courtesy of Australian Natural Resources Atlas V2.0



The Impact of Rail on Queensland Industries

Sugarcane

Sugarcane was introduced into Australia with the First Fleet in 1788 but it was not until the 1860s that a viable sugarcane plantation and raw sugar mill was established on eight hectares of land near Brisbane. From this humble beginning, the industry has spread along 2,100 kilometres of Queensland and the northern New South Wales coastline.

In the early years, much of the sugarcane was grown on private plantations. These plantations needed hundreds of labourers to operate them. However, the high cost of wages for Australian workers made it difficult for the industry to compete successfully with overseas sugar producers.

To overcome this problem, cheap 'contract' labour was brought in from the New Hebrides (Vanuatu) and Solomon Islands. Over 60,000 South Sea Islanders were brought into Queensland between 1863 and 1904, some illegally.

During the 1950s, the sugar industry boomed and fundamental changes took place. Tractors and mechanical loaders were developed which altered the way crops were harvested. The sugar industry was forced to adjust to these new labour-saving techniques, including the reduced employment opportunities that resulted. The 1960s also saw the introduction of new diesel locomotives used to replace the steam locomotives that had previously shifted the sugarcane to the mills for processing.

Queensland Railways have been participating for over 100 years in the great industrial activity of the sugarcane harvest and crushing season, which usually extends from June to December each year. Originally, sugarcane was hauled from paddock to mill by boats and steam locomotives. However, the introduction of new harvesters and a change from steam to diesel engines allowed the industry to expand its output and quality.

Today, Queensland's sugarcane railways—tram lines—annually transport in excess of 24,000,000 tonnes of cut sugarcane over 3,500 plus kilometres of primarily 2 foot (610 mm) gauge privately owned track. The nature of cut cane means that the cane must be transported to the mill within 24 hours to obtain the best quality sugar. Rail provides the most economic means to do this.

For many years, the tram lines were lightly built and poorly maintained with temporary track laid right into the fields. The locomotives were painted in bright colours for safety reasons and had individual mill colour schemes that displayed which privately owned mill they belonged to.

Today, however, tramlines rank among the world's heavy haul railways. Their track work standards often equal or exceed those of traditional railways and train lengths, tonnage and locomotive power have increased.

Locomotives originally hauled the cane to the mill on open wagons (see image 2). The hand cut sugarcane were made of whole stalks, these stalks were attached to the wagons using a single length of chain. The change to machine cut sugarcane meant that the smaller chunks of cane needed to be carted in open sugarcane train bins.

The rail system is also used at the end of the milling process in order to deliver the processed sugar to bulk shipping terminals.

The change to diesel engines and the implementation of mechanical harvesting had a huge flow on effect for smaller farmers and the labourers who worked for them. As the job became less labour intensive and turnaround times from harvesting to processing became quicker. The industry became quite profitable for those larger farms. Over time, many smaller growers have sold their farms, so that today the Queensland Sugar Industry is made up of far fewer growers and far fewer employees than in the early years.