Collaborative environmental science projects including Aboriginal and Torres Strait islander peoples

There are many national examples of collaborative environmental science projects involving Aboriginal and Torres Strait Islander peoples that link to relevant key knowledge and key science skills in Units 1 to 4 VCE Environmental Science. The listed examples enable exploration of conceptual understanding as well as providing opportunities for practical investigations, including hypothesis testing.

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| **Study design** | **Key knowledge** | **Examples of knowledge application** |
| Unit 1  Area of Study 1 | Range of biotic and abiotic components  of varied habitats | [Management of water resources by Aboriginal peoples](https://www.resources.qld.gov.au/__data/assets/pdf_file/0007/1408282/aboriginal-peoples-manage-water-resources.pdf). |
| Unit 1  Area of Study 2 | Contribution of data, technologies, regulatory frameworks and stakeholder perspectives in managing environmental challenges | * [Use of cultural fire practices to encourage native grasses to regenerate and produce new feed, to reduce scrub and fuel to prevent intense bushfires, and to promote biodiversity.](https://landcareaustralia.org.au/project/traditional-aboriginal-burning-modern-day-land-management/) * [Comparison of cultural burning and hazard reduction burning](https://australian.museum/learn/teachers/classroom-activities/cultural-burning/). |
| Unit 2  Area of Study 1 | Contribution of data, technologies, regulatory frameworks and stakeholder perspectives in managing pollution | [Beetaloo, Queensland, cooperative drilling program](https://public-health.uq.edu.au/article/2021/08/beetaloo-drilling-program-brings-potential-health-and-social-issues) including submission to a [government inquiry](https://frackinginquiry.nt.gov.au/?a=424231). |
| Unit 2  Area of Study 1 | Impact of pollution on health | [Clean water and soil for remote Indigenous communities](https://public-health.uq.edu.au/article/2018/11/clean-water-remote-indigenous-communities) – PFAS levels in Katherine, Northern Territory; heavy metals in Borroloola, Northern Territory; and microbial contamination of water in the outer Torres Strait Island. |
| Unit 2  Area of Study 1 | Options for treatment of pollution | Student-designed solution to local water pollution in the Kimberley [awa.asn.au](https://watersource.awa.asn.au/technology/innovation/student-combines-sugar-and-shells-to-filter-contaminated-water/#:~:text=Uriah%20Daisybell's%20water%20filter%20includes,of%20sugar%2Dcoated%20mussel%20shells.&text=The%20resulting%20prototype%20uses%20charcoal,his%20deadly%20metals%20water%20filter.)  [Global Indigenous community water treatment methods.](https://www.eolss.net/sample-chapters/c07/E2-14-03-04.pdf) |
| Unit 2  Area of Study 2 | Challenges to supplying adequate and affordable food | * [Farming and marketing of Kakadu plums](https://www.abc.net.au/news/rural/2017-10-04/kakadu-plum-plans-growing-kimberley-fitzroy-valley/8741130) – trial plantation of the native bush fruit gubinge (Kakadu plum): Marra Worra Worra Corporation and the Ngalingkadji community. * [Budj Bim Cultural Landscape](https://whc.unesco.org/en/list/1577) – Gunditjmara peoples’ creation, manipulation and modification of local hydrological regimes and ecological systems * [Partnerships in developing a reliable, safe and secure supply of ultra-premium Wagyu beef by introducing innovative, artesian micro-farming methods](https://www.austrade.gov.au/land-tenure/engagement-guide/how-do-i-engage-with-traditional-owners/mowanjum-aboriginal-corporation). |

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| Unit 3 Area of Study 1 | Sustainability and sustainable development | [Creation of Indigenous protected areas (IPAs)](https://www.niaa.gov.au/indigenous-affairs/environment/indigenous-protected-areas-ipas) to deliver environmental, socio-cultural and economic benefits for local Indigenous communities   * [Report of Birriliburu and MKK (Western Australia) IPAs](https://www.niaa.gov.au/sites/default/files/publications/BB-MKK-SROI.pdf) detailing stakeholder perspectives and environmental outcomes, including successful reintroduction of bilbies into the wild, with visual representations of stakeholder outcomes in collaborative environmental projects. |
| Unit 3  Area of Study 1 | Ecosystems as a source of renewable services: provisioning services; cultural services | * Native foods as a provisioning service – [health benefits](https://www.abc.net.au/news/2021-07-22/health-benefits-of-kakadu-plum/100204168) of Kakadu plums as food and pharmaceuticals. * Cultural significance of modified trees ([scar trees](http://koorihistory.com/modified-trees-scar-trees/)). * Landscape as a cultural service – sense of place; vandalism of the [Kooyang Stone Arrangement](https://easternmaar.com.au/media-release-destruction-of-the-kooyang-stone-arrangement/) at Lake Bolac. * [Cultural and ecological significance of plants](https://research.unimelb.edu.au/research-updates/indigenous-plant-use). |
| Unit 3  Area of Study 1 | Natural changes occurring over different time scales that influence ecosystem diversity… fire… | [Relationship between native and non-native herbivores](https://firecentre.org.au/unique-real-world-experiment-explores-link-between-fire-and-herbivore-activity/) and landscape fire with subsequent impacts on biodiversity – collaborative research (Beaufront, Tasmania). |
| Unit 3  Area of Study 1 | Value systems that influence decision-making processes | [Cities as indigenous places](https://nespurban.edu.au/cities-for-people-and-nature/). |
| Unit 3  Area of Study 2 | Factors that influence responsible decision-making, including diverse stakeholder values, knowledge and priorities, regulatory frameworks that inform environmental management strategies, use and interpretation of historical and current scientific data, and application of new technologies | Case studies related to the cultural importance of [environmental science water management projects](https://www.mdba.gov.au/sites/default/files/pubs/rivers,%20the%20veins%20of%20our%20country_1.pdf):   * water management of Gunbower Forest (Barapa Barapa Traditional Owners, Victoria) * wetlands project (Ngarrindjeri Regional Authority, South Australia) * water conditions for basket weaving (Yorta Yorta Nation, Victoria) * rehabilitation of a cultural site (Barengi Gadjin Land Council and Wotjobaluk Traditional Owners, Victoria) * water release to restore river ecology (Taungurung Traditional Owners, Victoria) * Chowilla floodplain water – cultural heritage protection (First Peoples of the River Murray and Mallee Region, South Australia) |
| Unit 3  Area of Study 2 | The effectiveness of environmental management strategies implemented in relation to upholding sustainability principles | Budj Bim Cultural Landscape   * [Gunditjmara peoples’ creation, manipulation and modification of local hydrological regimes and ecological systems](https://whc.unesco.org/en/list/1577). * [Environmental management](https://www.environment.gov.au/heritage/places/national/budj-bim) |
| Unit 4 Area of Study 2 | Interconnections and tensions between factors that influence responsible decision-making around building a sustainable energy future | [Beetaloo, Queensland, cooperative drilling program](https://public-health.uq.edu.au/article/2021/08/beetaloo-drilling-program-brings-potential-health-and-social-issues) including submission to a [government inquiry](https://frackinginquiry.nt.gov.au/?a=424231). |