

## **ENGAGING STUDENTS IN ENVIRONMENTAL EDUCATION**

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### **YEAR 7 DOWN THE DRAIN**

The 'Down the Drain' unit is a year 7 integrated unit designed to engage students in environmental education. The purpose of the unit combines the study of the local drainage system with an understanding of the effect of what humans put down their drains, on the local environment, specifically Flooding Creek in Sale. The outcome is to then, take positive action to improve public awareness regarding clean stormwater drainage.

This unit was proposed in 1997 and a team of 4 teachers developed the curriculum which was trialed the following year. The material developed covered a number of CSF outcomes from level 5 in SOSE, Science, English, Mathematics, Personal Development (PD) and Information Technology (IT). As we are a Catholic school, it was felt that Religious Education should be an integral part of the unit, whereby students focus on the "Creation" story. For the duration of the unit, students study material specific to each Key Learning Area (KLA) and links between the subjects are highlighted, whilst maintaining the integrity of each of the KLA's. Having the students make connections between subjects is an important aim of this unit.

The unit fosters a team teaching approach as teachers from each of the subject areas work closely together for the duration of the unit. In many cases, a teacher will take the unit for two subjects, ie SOSE and English or Science and Maths. Weekly planning meetings are held by the teaching team. The team approach is also integral to the unit in that the students work in teams and present their learning in small groups. The students learn effective team work in the PD component.

Initial contact was made with the local waterwatch coordinator Greg Gilbert, who made available resources including the Waterwatch Education manual and StreamScan program. The latter program is a technology based activities program designed to help students monitor their local catchment, and has been successfully used for the last 6 years. Unfortunately due to a new operating system installed in our school, StreamScan will not be used as of 2005. We are currently investigating other technology-based tools to replace this program.

The unit begins with a variety of classroom activities to familiarise the students with the concepts involved, including local catchments, impact of human activities - especially sources of pollution (stormwater and sewerage), field trip preparation and mapping exercises.

A preliminary field trip, led by our Waterwatch coordinator, takes students to significant stormwater locations around the town. We visit the Sale Cattle Yards, two sites along Flooding Creek with large stormwater outlets. The Port of Sale and Lake Guthridge (a reclaimed swamp site where residential area stormwater run-off accumulates) is also investigated.

A second field trip to collect samples of macro-invertebrates and conduct habitat surveys from the two Flooding Creek sites is carried out in week 3. The data and samples are taken back to school for analysis in Science. Students work in teams to complete a field trip report

which compares the health of the creek at both sites, using macroinvertebrates as biological indicators and taking into account, the land use at each site.

Further research in SOSE includes food webs, comparing Aboriginal and European uses of the land and the teams research and present a PowerPoint on Blue Green Algae. In Religious Education students interpret different Creation stories and discuss the importance of respecting the land. In Mathematics, they collect and count the rubbish from the footpaths and areas adjacent to the fast food precinct, and analyse their results using graphs and mathematical formulae. One group managed to collect 400 cigarette butts from the area used by the staff of one of the local supermarkets, in 2004. The English component involves a comprehensive study of Tim Winton's novel *Lockie Leonard Scumbuster*, the story of a young surfer and his friend who set out to solve the pollution problem in their town. Throughout the unit students further develop their skills in various computer applications to publish their findings. Other activities include letters to local newspapers and Wellington Shire council.

Each class negotiates a Community Service project that involves direct action to benefit the community. In past years students have been involved in extensive tree planting projects in conjunction with Landcare. They have cleaned up sections of Flooding Creek around the stormwater outlet that flows from the Gippsland Centre shopping complex, and have even managed to find a microwave oven and several shopping trolleys amongst the muck! Students have created and distributed pamphlets in the local community aimed at raising awareness of stormwater pollution. Catholic College Sale students won the regional drain stencilling competition with the slogan, 'What you drop the rivers cop.' Funding was made available for the slogan to be stencilled on side entry pit covers by our students throughout Sale.

The culmination of the 'Down the Drain' unit is the student display. Each team has the opportunity to demonstrate their learning at a public display to which parents, staff, other classes and local primary schools are invited. Teams choose the work that will be presented, ranging from models, games, practical demonstrations, posters, songs, videos, PowerPoints, field trip reports. They are also encouraged to create hands-on activities for the primary school visitors.

As a direct result of student actions we have been responsible for significant achievements. Lobbying of the local council has resulted in the installation of gross pollutant traps (GPT's) at Flooding Creek and the Port of Sale. Recent monitoring by last years' group found, for the first time, Mayfly Nymphs at a site previously considered degraded. This site was directly downstream from the new GPT at Flooding Creek below the shopping centre. New bins have been placed outside some fast food outlets that had been identified as contributing significant amounts of rubbish to the stormwater system.

In late 2004, the Down the Drain unit was reviewed and improved to incorporate new resources and initiatives that have been developed since the inception of the unit. In 2005 we will also focus on working closely with local businesses, with the aim of reducing pollution from businesses into the stormwater system. We believe that as a result of this innovative program, Year 7 students at Catholic College Sale, in conjunction with Waterwatch, have made a positive contribution to the environment and the future of our local region.

The students then have the opportunity to enhance their learning and experience through participation in a semester length Year 9/10 Biology unit. This unit allows for further

engagement in environmental education through focussing on Water as the primary theme.

## **YEAR 9/10 - *SALT WEDGE* PROJECT**

Incorporated into the Year 9/10 Biology program is a 5-week topic on Ecology. Outcomes are based on Level 6, CSF2 guidelines. The students revise basic ecosystems using our local wetlands as the focus. Sale Wetlands are part of the extensive wetlands system of the Gippsland Lakes region that come under the international RAMSAR agreement to protect migratory bird breeding sites. Our students visit the Sale Wetlands on a preliminary field trip where wildlife observations are conducted, along with some basic water testing. Back at school, emphasis is placed on recognising the connections between the two, to construct food webs and investigate further the environmental links between this site and the Gippsland Lakes.

The class works in small teams to research the geography, history and ecology of the Gippsland Lakes using the Internet. The ecological importance of the major rivers on the Lakes ecosystem is introduced here. We also work with the local Waterwatch Coordinator at this point, who introduces the impact of the permanent channel at Lakes Entrance that was constructed in the late nineteenth century. This opening, connecting the lakes to the sea, has allowed salt water from the ocean to intrude into the lakes system ever since.

Students complete a mapping exercise using Waterwatch data. This tracks the increasing salt concentrations throughout the Lakes system as we move from Sale towards the permanent entrance. The question as to how this salt intrusion into the lakes system and local rivers has the potential to impact environmental change to the Lakes system, is posed.

A second field trip to investigate salt intrusion into our local rivers, the Thomson and Latrobe rivers is then conducted. Students monitor water quality at various depths at three sites along the rivers. We use two local bridges for easy access and collect data for electrical conductivity, pH, dissolved oxygen and temperature. Habitat surveys are also conducted at the three sites. Back at the lab, students analyse their data using Excel and complete a field trip report, in teams. In 2004 we experimented with different formats and most students chose to present the results of their investigations as a PowerPoint presentation.

Catholic College Sale students have been investigating this phenomena for three years and collected some interesting data. We have concluded that salt intrusion into the rivers is very significant in the drought years, as flows are low and salt creeps up into the lower reaches of the rivers along the bottom. We have called this phenomenon the *Salt Wedge*. We ask what long and short-term effects this may have on the riparian zone of the river and the associated wetlands.

In 2004 we were fortunate to receive funding from Watermark, an organisation devoted to the protection of wetlands. We purchased equipment for both campuses and the school was invited to the Watermark Board's AGM to demonstrate how they had utilised the funds. Catholic College Sale students from both the Year 7 'Down the Drain' and the 9/10 Biology class confidently presented their PowerPoint presentations at the meeting. In 2002 Catholic College Sale students also presented at the Student Waterwatch Conference held in Sale. This conference, facilitated by Greg Gilbert, drew on local schools and community groups to share the results of their projects and investigations with each other.

Through these innovative and exciting programs, Catholic College Sale will continue to link in with Waterwatch and associated groups, to provide opportunities for our students to be engaged in environmental education at the local level. The ability to demonstrate their learning to others and become involved in activities that educate and benefit the local community, is a vital component, and essential to the continued success of both of these projects.

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**Biographies:**

Julie Bradley has a Bachelor of Environmental Science and has been involved in environmental education in the community for a number of years. She is a former Waterwatch Co-ordinator with a passion for environmental education. Julie has been the Director of Teaching and Learning and teaches Biology, General Science, SOSE and Geography at Catholic College Sale. In 2005, Julie will be Head of the Science Faculty.

Dianne Stebbing was involved in education for a number of years as a Teacher's Aide and Audio-Visual technician before completing her teacher training. She has a Theology and Media Studies background, a passion for environmental education and landscape photography. Dianne is the Assistant Head of the SOSE faculty and currently teaches English and SOSE at Catholic College Sale.