River Detectives Program

Story of Change

St Patrick's PS Wangaratta,

North East CMA region

River Detectives is a cross-curricular, citizen-science program connecting teachers and young people with their local waterway. Through water quality testing, macroinvertebrate sampling, and habitat surveys students learn about the importance of catchment health and their role in caring for it. The website provides access to a wide variety of engaging resources inspiring teachers to embed River Detectives in school and community life.

Since 2016, the program has been available to school and youth groups in five regions across Victoria.

In the North East CMA region, Katie Pallot is a P-12 science teacher currently working as a specialist science teacher at St Patrick's Primary School in Wangaratta. She teaches the science program school wide and leads an extension program for students who have shown a particular aptitude, giving them a place to shine when they may have difficulty in other areas.

Katie and the school became involved in the River Detectives program at the start of 2019.

"St Patrick's has a sustainability team and student sustainability leaders however previously to 2019 the sustainability program was focused on changes the school community could make on school grounds to improve sustainability including increasing biodiversity and reducing waste."

With her science background, Katie could see the River Detectives program provided a great opportunity to look outward to the broader community and environment.

"River Detectives is run with students from Grades 1-6 involved in the extension program and offers them a chance to be involved in real life community action. The Wangaratta area is blessed with many waterways. Rivers and streams play an important role in community life and the life of families in their recreation time."

Katie comments that one of the best parts of the program is its versatility. The many components of the program mean that the three different groups she's worked with have been able to pull out different aspects and run with it;

"The Grade 1/2 extension students participated in the program first. They gathered data at three monitoring sites; One Mile Creek, King River and the Ovens River. Each week they visited one site to complete water quality tests and waterbug sampling with all three sites tested once in a three week period.

Students walk to the One Mile Creek site and I drive them to the King and Ovens River sites.

When the Grade 3/4 students participated in the program they were challenged to look at data more deeply, consider patterns, why they might be occurring and what they meant for the waterway.

At the beginning of this year, before COVID-19 struck, the Grade 4/5 students were involved. They were really loving the macroinvertebrate sampling so this had become a huge focus of their work."

Katie reflects on some of the highlights of their River Detectives experience;

"The Grade 1/2's were involved in a River Detectives webinar on native fish during 2019. They learnt about Mosquito Fish and became very interested and concerned about the impact of this introduced specie on native aquatic life. They completed research, developed a powerpoint presentation and delivered it passionately at a school assembly explaining the issue to the entire school and explaining why Mosquito Fish are so bad. Everyone listened intently to these junior students advocating for their local waterways.

The Grade 3/4's, after analyzing water data produced fantastic written reports summarizing their results and the impact of their water quality findings. Their work really demonstrated the level of confidence students had in their learning and how much they'd enjoyed it.

The Grade 4/5's enthusiasm for macroinvertebrates saw them develop great plans to produce a 'Sleep Geeks' video on this year's theme of water however this had to be cancelled due to lockdown."

Seeing students share their knowledge and report back to school assemblies is one of the most significant changes Katie has observed of her students' participation in the program.

"This generates quite a lot of interest among the rest of the school. I often have students approach me around the school asking 'can I be a River Detective too ?'"

Katie comments on the impact the program has had on the school, her own teaching and the students;

"To involve students in community-based citizen science, schools often synthesise/manufacture situations to create learning opportunities. The River Detectives program shows that here we are as citizens in Wangaratta surrounded by rivers and it is our responsibility to find out about them and share what we know about looking after them. We have a chance to participate in real citizen science to understand how water quality affects things, how our agricultural industry relies on good quality water and how everything in our environment is linked."

Katie has experienced evidence of student learning outcomes first hand;

"Apart from the work students have produced we have a lot of parents that provide great feedback about the conversations that are happening at home. Students are talking excitedly at home about the macroinvertebrates they've found at the river or the level of pH that was tested, etc. One particular student struggled with engagement at school but loved being part of the extension program. His parents were amazed to hear him talking so passionately about the waterbugs he'd discovered in the evenings around the dinner table."

During COVID-19 the program has been postponed and although they haven't had an opportunity to use the activity matrices developed by the River Detectives Team they will certainly use them in future.

Looking ahead Katie says, "*We currently have a Landcare Grant to boost biodiversity in the school yard. We have had support from our local council and landcare group with the provision of plants. Our goal in the future is to get involved in some rehabilitation activities at our local waterways. With my secondary science teacher hat on I also look forward to getting stuck into using the real data sets we have collected from all three waterways and looking at them with the Grade 6 maths extension group."*

For more information: Email riverdetectives@nccma.vic.gov.au or visit www.riverdetectives.net.au

River Detectives Program

Story of Change

Carlisle River PS, Corangamite CMA region

River Detectives is a cross-curricular, citizen-science program connecting teachers and young people with their local waterway. Through water quality testing, macroinvertebrate sampling, and habitat surveys students learn about the importance of catchment health and their role in caring for it. The website provides access to a wide variety of engaging resources inspiring teachers to embed River Detectives in school and community life.

Since 2016, the program has been available to school and youth groups in five regions across Victoria.

In the Corangamite CMA region, Jeff Douma is the principal of Carlisle River Primary School, a small school of just nine students nestled in the Otway Ranges. The school has been involved with the River Detectives program for many years.

"We have always been interested in the indigenous flora of the local Carlisle River forest. We were very fortunate to have a passionate teacher, Gail Maddern, work with us to learn about the biodiversity of our area"

"The late Mrs Laura Bocker (early years teacher) first got our school involved with the River Detectives program. She had a passion for nature and we soon found it was the perfect program to involve our students in learning about the local environment."

Students and staff have adopted a site on the Carlisle River, a small waterway in the Corangamite catchment of the Otways area. It is a tributary of the Gellibrand River with running water all year round.

At Carlisle River PS the whole school is involved in the program.

"We do water sampling at least once a month at Carlisle River. We all walk the 1km to the river (subject to weather) and undertake the testing at the bridge over the Carlisle River. All of the students from prep to Grade 6 are involved. Older students work with younger buddies to undertake the five tests. The older students take the lead on the more complicated tests such as reactive phosphorus, electrical conductivity and turbidity and the younger students take the lead testing pH with strips and taking photos of the site. On our return to school students add the results on the Waterwatch chart displayed in the school breezeway for parents and visitors to see."

Jeff comments that it has been great to be involved in the program over many years to collect lots of data and for students to become very familiar with the program and the river's health through their involvement from Prep.

"Students enjoy being out and about and making a connection with the land and water. They love walking to the river and having time to admire the river. The testing is always interesting. The students estimate the quality of the water due to various factors such as rain, presence of weeds, etc."

Older students remember a time when river levels were higher;

"A fish ladder was installed some years ago which banked up the water and created a much-loved swimming hole for locals however it has since been removed so water levels at the monitoring site are generally lower now with the water flowing more freely."

Other changes have been observed over time;

"*Some time ago a program of fencing was undertaken to fence off local farmland from the waterway. Revegetation was added and it was all looking terrific but it hasn't been maintained and now weeds such as blackberry have taken over the site making access to our testing site very difficult."*

Talking about these local issues gives students a real-life experience of how land and water management decisions impact plants, animals, land, water, people, industry and communities. Jeff reports that his students really love being involved in the River Detectives program.

"*The program helps students really appreciate the importance of looking after our waterways. Our area is a dairy farming area. Learning about the Carlisle River makes students more aware how water quality could impact on local industry."*

Jeff speaks passionately about one of the highlights of the school's River Detectives journey;

"*In 2019 we set ourselves a goal to see as many waterways in our local area as possible. We researched to find the very start of the Carlisle River. We enjoyed an excursion where we travelled to the source which was actually a spring and then followed the waterway 20-30km to the mouth. This was a fantastic experience for the students to see the waterway on a landscape scale, see how it is an integral part of our area and understand the impact that upstream activities could have further downstream and on the ocean."*

"We visited waterfalls, rivers, creeks, the confluence of the Carlisle and Gellibrand rivers and also the estuary of the Gellibrand River at Princetown. The older students visited Camperdown Treatment Plant and learnt a lot about how river water is turned into our tap water."

This year's COVID restrictions have meant challenging times for schools but fortunately Carlisle River PS was able to continue with testing as a few students were still at school during lockdown. During this time the remote learning matrices developed and distributed by the River Detectives team were very useful.

"Students were given the opportunity to choose a selection of activities from the matrix that appealed to them. Due to the lack of internet at many students homes, the resources for chosen activities were then printed out by staff and posted to students. Students were asked to work on their chosen activities one afternoon each week for one hour. One student did a wonderful job of the rainbow task from the Nature Study matrix, thoroughly enjoying searching for natural objects from every colour of the rainbow. He had trouble with blue but found some hay band on his farm. The final product looks amazing."

Looking forward Jeff plans to continue water testing and as school life returns to normality hopes to undertake waterbug and habitat survey activities. He would also love to see the Billabong Banter area of the website used more by schools to share the great River Detectives activities they are doing.

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River Detectives Program

Story of Change

Mount Lilydale Mercy College,

Melbourne Water region

River Detectives is a cross-curricular, citizen-science program connecting teachers and young people with their local waterway. Through water quality testing, macroinvertebrate sampling, and habitat surveys students learn about the importance of catchment health and their role in caring for it. The website provides access to a wide variety of engaging resources inspiring teachers to embed River Detectives in school and community life.

Since 2016, the program has been available to school and youth groups in five regions across Victoria.

In the Melbourne region, Urszula Faulkner is the Science Faculty Learning Leader at Mount Lilydale Mercy College, which is a Catholic co-educational secondary College located in Melbourne's outer east that was founded by the Sisters of Mercy in 1896.

The school has a sustainability focus;

"We are a ResourceSmart school. We have solar panels, we track our electricity and water usage. We also have an agriculture/horticulture program that looks at sustainable farming. I had heard of Waterwatch and was interested in having real life data to use with students. The River Detectives program fits well within the Year 7 and Year 10 science curriculum."

The school has been involved in the River Detectives program since 2017 adopting a site on Olinda Creek. The Creek goes through the suburb of Lilydale and is beside the town oval and train station. It's flows fluctuate due to stormwater inputs.

"All Year 7 students participate in the program completing one water quality test and one waterbug sampling activity in term 3. Macroinvertebrate sampling provides opportunities to learn the classification of species and use a key to identify bugs. During their Ecosystems unit, students participate in an excursion with five activity stations. Students complete water quality tests and complete worksheets on site. Being secondary students in a well resourced science department they enjoy using some additional equipment; pH meters, dissolved oxygen meters and low range reactive phosphorus test kits that measure in parts per billion. After the excursion the students complete a reflection task."

"Year 7's participate in the River Detectives program in spring. This coincides well with Science Week in August and the College's Sustainability Week. During Term 3 they complete 10 water quality tests of the six parameters (including dissolved oxygen). During Terms 1 and 2 there is a year 10 elective program with a subject involving the RD program. Some students choose to do this elective.

For all tests, we used to take the students out on site but now at times staff collect water samples for testing at school. This offers better learning outcomes as testing, reflection and extension can all be done fluently. Students are involved with data analysis and comparing different measuring tools."

Urszula finds that the 'Run of the River' board game on the River Detectives website is a great place for students to start.

They are given time to play the game designed for secondary students that helps them learn about our precious rivers, the ways people and wildlife use rivers and creeks, and some recent approaches to the sustainable management of our rivers and water supplies.

"It challenges students to find out more about water resource management and river health issues. Students play, experiment, explore and reflect on the way different management decisions impact on waterways. This then leads to an interest in learning more about their own local waterway through the RD program."

Urszula reflects on one of the most significant changes the River Detectives program has made;

"Students have been involved in a rehabilitation project further downstream towards Coldstream in conjunction with Melbourne Water and Shire of Yarra Ranges. They grew and planted out indigenous native species.

It has made students realise that creek rehabilitation is doable. The rehab project came about due to work done by a number of dedicated people at the College but the River Detectives program has shown how the project can be linked to the curriculum in areas such as Science."

The River Detectives program has made a positive impact at the school. Urszula comments that *"It allows students to contribute real life data to real science. Admittedly our data is a small snapshot of the health of our waterway but students get a connection to the waterway, they notice changes in its health and the develop a sense of ownership toward the waterway."*

Due to its urban location, when students begin in the program they often presume there'll be no life in the river. Comments such as 'There'll be nothing in there Miss' are common and students are astounded when macroinvertebrate sampling proves them wrong.

Urszula reflects on what she enjoys most about the program;

"the program is more than just water testing it's about analyzing that data and having students feel empowered to make changes in their own community.

Some students simply may not excel in the classroom. Fieldwork through the RD program gives them the opportunity to come up with amazing conclusions. It is really lovely to see these students shine."

Participation in the program is sometimes difficult due to inclement weather but this is also a great lesson for students to see how weather conditions impact on waterways.

This year's COVID restrictions have seen the program postponed at Mount Lilydale Mercy College but Urszula assures that the program will be picked up again in Term 3.

In future, she would love to see the school involved in rehabilitating a second waterway site.

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River Detectives Program

Story of Change

Jeparit Primary School, Wimmera CMA region

River Detectives is a cross-curricular, citizen-science program connecting teachers and young people with their local waterway. Through water quality testing, macroinvertebrate sampling, and habitat surveys students learn about the importance of catchment health and their role in caring for it. The website provides access to a wide variety of engaging resources inspiring teachers to embed River Detectives in school and community life.

Since 2016, the program has been available to school and youth groups in five regions across Victoria.

In the Wimmera CMA region, Heidi Lees is a teacher at Jeparit Primary School, a small school community of 17 students where all students from Foundation to Grade 6 participate in the River Detectives program. The Wimmera River flows through the farming area of Jeparit before terminating at Lake Hindmarsh just north of town. Lake Hindmarsh is Victoria's largest freshwater lake and the first of a series of terminal lakes. The river is an important feature of the town and a common point of reference for students who come from a variety of backgrounds.

The school has a long-standing association with the Wimmera River. They began monitoring the waterway in 1996 as part of the Waterwatch program and have maintained a connection with the river over the years thanks to support from their regional coordinator and freelance environmental educator Jeanie Clark and by liaising closely with the local Jeparit Waterwatch group.

When Heidi joined the staff in 2018 she strengthened their association by joining the revamped River Detectives program.

"*I saw the training advertised and thought it was a great opportunity considering the Wimmera River flows through our school's 'backyard'. Our school had just started a kayaking program in 2018 and I felt that the two programs would complement each other. The students learn about the river they are paddling on, know how to look after it and appreciate the river more. It is my philosophy that students learn best through hands-on learning. Therefore, students collect real data for graphing rather than pretend data."*

Heidi outlines that River Detectives is the core program that engages Jeparit PS students in sustainability education.

"Things have been disrupted due to Covid, but we have always tried to complete our monthly water quality monitoring. Before Covid students ventured down to the river during geography or science to collect the sample, we completed the testing back at school. Data was then uploaded onto the website. We also took part in macroinvertebrate sampling in March and October. Jeanie collected bugs from the river and brought them into school for our students to experience. This activity adds a different dimension. Students become aware of what lives in the river, what should live in it, the role waterbugs play in the food chain and learn to appreciate the importance of keeping the river healthy.

With support from Jeanie we have learnt about the effects of flood, drought, and humans on the Wimmera River over time, especially their impact on salinity levels and turbidity. We notice that salinity levels are generally quite high. We learn about the fauna that visit our site through observations of tracks, scats, nests and other clues. We know which fauna have visited our site."

Reflecting on her River Detectives highlight, Heidi spoke passionately about a project they have been able to achieve throughout 2020 and 2021 despite the challenges of Covid-19 and remote learning, testament to the program's flexibility and potential;

"In 2020 during remote learning, students were learning about erosion in science and mentioned that they'd noticed erosion on the river banks when conducting monthly testing. Students wrote letters to GWM Water, Land care, Jeanie, and local farmers to ask if they could interview them about what we could do to improve the river and prevent erosion. We met on WebEx, and students learnt that revegetation could help to minimise erosion. We then successfully applied for a Junior Land care Grant to tackle the problem.

Between lockdowns we invited ecologist Mirinda Thorpe to visit. She walked along the river with students,identified native plants growing on the banks and discussed the benefits of revegetation. Then, in November we visited Dalki Garinga, the Wail native nursery, where nursery manager Paul Lehmann taught us how to propagate plants indigenous to the area.

Next, we enjoyed a visit from Barengi Gadjin traditional owners. They helped us to observe culturally significant sites. The students saw middens and learnt about what traditional daily life would have been like along the river. They taught students about their culture, traditional tools and environment.

Parks Victoria supported us to identify suitable revegetation sites protected from people/cars providing plants with the best chance of success.

In May 2021, students planted out the plants they had propagated at the nursery in November with the support of representatives from Barengi Gadjin, Parks Victoria, Paul Lehmann, Hindmarsh Landcare and the Jeparit Town Committee.

To educate the broader community and raise awareness we put up a display in the main street to explain the project."

Grant money was allocated to funding the ecologist's visit, the nursery excursion, and to purchase plants. But, as is so often the case when good people come together on inspiring projects, organisations and individuals were so supportive of the project that many donated their time and materials. Heidi explains the next goal of the project;

"We aim to use leftover funds to install bollards to protect future revegetation sites in areas frequented regularly by people for recreation, as vehicles in these areas would be likely to damage existing vegetation and new plantings. We also plan to install signage at the revegetation site outlining the project activities and goals, acknowledging project partners, promoting local user groups, sharing thoughts about why the river holds value for them and why we need to look after it. We hope the sign will communicate how local groups are working together and share that for people to use boats on the river, it needs to have water and to have fish in the river, the water needs to be healthy. We need to look after each other so we can all enjoy the benefits of the river.

An annual fishing competition is held at Easter and we have dreams of supplying information to participants when they register to let them know about our project and encourage them to look after the plantings whilst fishing."

The fishing competition is an important event for Jeparit. People come from near and far to participate, fishing and camping along the river. Heidi feels it's very important for all in the community to support events such as this because they bring people to the area, and it's great for socialising and for health and wellbeing.

"There is a real need for us all to work together so that people can still fish, still boat, and protect the river from erosion. If we have a common understanding that all of these activities are great and we work together, we will continue to enjoy the benefits of the river for many years to come."

Jeparit PS was proud to have received a Highly Commended mention for the Woolworths Junior Landcare Team Award at the 2021 Victorian Landcare Awards for its innovative and collaborative project.

Covid-19 has heightened awareness of supporting students' learning of key concepts. Heidi values the opportunity to implement River Detectives content through literacy and numeracy activities so teachers can satisfy the demands of core curriculum areas whilst engaging students in the River Detectives program.

"Students have learnt science and geography concepts like understanding erosion and revegetation. They collect field data when we visit the site. Water quality testing gives them confidence with scientific processes. In Maths we use the data we collect for graphing. Recounts of their experiences visiting the nursery, propagating and learning from the ecologist and traditional owners were written by students and published in the school newsletter."

Heidi explains that the River Detectives program provides hands-on learning and encourages students to be more observant.

"Students love to be out in the environment and nature and as we walk to our test site, the students notice things – flora and fauna – and then they ask questions about what they're seeing and why it might be occurring. Sometimes they google or sometimes they contact Jeanie for more information. It's precious learning out in the environment instead of learning from a textbook. Students spend time at the river with family during holidays, weekends and after school; now they have an understanding of what's under their feet, the reason for looking after it and how we can do that."

One of Heidi's greatest joys has been witnessing how some students who struggle with the academic challenges of reading and writing in the classroom "come alive" outdoors by the river.

"During our excursion with Mirinda, one student asked so many questions and was so enthusiastic about participating. I realised this activity was something this child could excel in, go on with in life and be successful."

Heidi values the support of her regional River Detectives coordinator.

"Jeanie is so knowledgeable and inspires the teachers she trains. We rely on her so much. Her role as coordinator is so valuable to support schools undertaking the program. Continued funding is essential to enable her to continue this role. She takes away my stress and we love to see her out in schools doing hands-on activities with students and staff."


JEPARIT PRIMARY SCHOOL
GRADE 6 2021
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