

Stormwater and Its Adaptations!

Stormwater in Schools and the Community

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ABSTRACT This Paper presentation will showcase a variety of approaches to stormwater education, with an emphasis on integrating activities to form a whole program, while allowing for components to be presented individually.

While the approaches presented will focus on regional centres or smaller towns, it will have a general application to stormwater education everywhere.

The main components of the integrated approach are:

- General introduction – What is stormwater? How is it captured and where does it go?
Extensions include impacts of stormwater, and actions and design features intended to reduce the impacts and improve the water quality of stormwater.
Introduction includes use of posters, stormwater models and simulations demonstrating the impacts of human activities.
This component can be run at a classroom level in schools, and as part of a workshop session in the community, or even as part of an integrated town “tour” with adult groups.
- From Theory to Practice – finding out in the field how stormwater works and what happens to the water in a variety of scenarios. This component can include:
 - stormwater town walks – to investigate the routes and methods for capturing and directing stormwater
 - follow the creek! – to see what happens when stormwater enters waterways and to identify key local problems and impacts.
Includes testing for water quality at key locations.
 - Speaker from local council or water authority
 - Written work/art work to summarise learnings
- From Theory to Action! – educating the community about stormwater and ways to lessen the impacts on stormwater. Ideally, relevant bodies (eg Local Government) will be consulted early in this stage to seek permissions, advice, and to include them in the process
 - identifying local stormwater issues and problems – what can be tackled and how to disseminate information on school/community action to the broader public
 - displays and brochures outlining issues and proposed action
 - drain stencilling as a way to involve students and the community and to present relevant messages about impacts on stormwater.

- relating drain stencilling as an activity to the environmental obligations of local councils.
- influencing decisions on stormwater management, including relevant local government responsibilities, simple forms of stormwater control (litter traps, grassed swales), wetland treatment regimes, water-sensitive urban design

INTRODUCTION

Taking up and using stormwater as an educational theme has become a recurrent strategy for co-ordinators working in the Wimmera Community Waterwatch team. Beginning a number of years ago through the work in schools of Jeanie Clark, a number of variations of the stormwater theme have developed, all allowing for student and community input to varying degrees.

While some of the initial work focussed on Horsham, the main provincial city in the Wimmera, the application of stormwater education now relates to towns and schools of all sizes, some with populations as small as a few hundred people. Town size has meant that imagination and ingenuity are required to set up programs relevant to different communities, often in the face of community indifference about stormwater.

The launch and distribution of the Stormwater Education Manual (Waterwatch Victoria 2003) marked a new and more intensive phase in stormwater education. For the Wimmera, it presented new opportunities in encouraging this component of Waterwatch in all the schools which received the manual. It also allowed co-ordinators (and teachers) to use the general and regional catchment resources readily available in the manual, or to devise their own resources or approaches.

The purpose of this paper is to outline some of the more varied approaches, but also to emphasise that while a program needs to be integrated and presented as a package, a degree of variation and flexibility has to be maintained.

BEGINNING THE PROGRAM

In Schools

Prior consultation with teachers is important so that involvement in this program can help them realise their curriculum goals, as well as opening the way to broader environmental messages in the classroom. It is also important to outline the various components of a stormwater education program, the options/variations open to them, and the ultimate outcomes of conducting such a program.

In the Community

Although contact with people in community groups may be optional, certainly a sounding out of key people from groups affected by the program is important, as they can gain an appreciation of what you will be doing and how it relates to their interests. For example, as co-caretakers of the Kaniva Town Wetlands, the local Lions and Rotary Clubs need to be aware of programs such as Waterwatch that relate to stormwater and how it might relate to their management of the area. This can have additional side-benefits, such as an invitation to present information and data on water quality and wetland management to a club meeting.

COMPONENTS OF STORMWATER EDUCATION IN SCHOOLS

What is stormwater?

While the answer to this may seem obvious, it can mean different things in different locations. A town like Nhill or Warracknabeal has a typical stormwater/sewerage delineation, while the small towns of Goroke and Apsley have no town sewerage system, and rely on individual household septic tanks. Most of these tanks were installed prior to whole-waste septic systems, and this means that greywater is fed directly from houses to the street and into the stormwater system. Obviously, this has implications for stormwater management and how you approach stormwater education in these communities.

Introducing the Concepts

Through the use of posters and Wimmera Community Waterwatch's stormwater models, students are introduced to the various ideas surrounding stormwater. These include definitions (stormwater/sewage model), stormwater management (trash rack model), and reducing human impacts on stormwater (dog poo model, car wash model). It is also possible to improvise models that show the flow of stormwater from house overflows to the end point of stormwater distribution in a particular location. Exercises for students can include their interpretation of stormwater movement or the use of diagram cards that students rearrange in order to show how stormwater moves around a typical town or city.

Students are also introduced to the different local variations that apply to "their" town's stormwater system – gutter configurations, side entry pits of many forms, open drains, underground drainage systems and so on, and in doing so how they might influence the quality of the stormwater and contribute to the level of human impact on the water. A useful extension exercise is to run a slideshow depicting stormwater movement in a wide variety of situations and seek feedback on the effects on stormwater quality.

Practical Strategies

In my experience, a town walk or "tour" is a useful and hands-on way to follow up the various aspects of stormwater explored in the classroom. This essentially is a student walk around the town following the route that some of the stormwater takes – it is usually too difficult to demonstrate a whole system, so care needs to be taken in selecting a route that effectively

illustrates how the local stormwater system works, and this will require some reconnaissance and planning prior to the event. As the walk progresses, stops are made at critical points to explain features (such as the local system design) or look at human impacts. It can be useful to take water quality tests at locations where this is possible, for progressive comparison – this also allows student analysis and extension work back in the classroom. For example, salinity, pH and Phosphorus tests can be especially important in those towns that have combined stormwater/greywater systems.

A typical component of a town walk is to include a litter or gutter survey. Students (usually in groups) collect data on observed litter along the route of the system, and compare notes at various points and at the end of the walk. This serves to raise awareness of just how much litter occurs in the environment, and to consider how this impacts on the quality of the stormwater. It also is a great way to introduce students to ways that stormwater management can be improved.

Local stormwater walks have been an important component of the stormwater program in nearly every school where this has operated. Jeanie Clark's version adapted for Warracknabeal and Jeparit, "From gutters to the Creek", adds a further dimension in applying this strategy, as creeks and rivers are very much part of the equation in her Lower Wimmera Catchment area, while different end points for stormwater have to be considered in the western catchment.

Other practical strategies can include speakers from the local council or water authority, providing a forum for the development and planning issues of a town stormwater system; and the use of written work/art work in the classroom to highlight learnings and produce material that may be able to be disseminated more widely.

Outcomes for the Stormwater in Schools Program

Schools are open to various ways that stormwater issues can be tackled. Obviously, these need to be practical and achievable in the time frames that are available to teachers – long drawn out strategies are not recommended, as classes and teachers run out of time and motivation.

An initial and immediate action subsequent to strategies mentioned above is to work with the student group to identify issues and problems relating to stormwater locally, decide what can be tackled and how. Immediate responses can lead to preparing posters for public display or working as a group to prepare a brochure or pamphlet to educate the public about stormwater issues or ways that the community can contribute to better stormwater outcomes. Posters may be displayed in public areas (Shire Offices or local halls), or be part of a wider display at a local market or agricultural show. Brochures can be distributed via letter drops, availability at public access points, or even distributed through a school newsletter. There are many imaginative ways of getting the message out there.

One of the increasingly used methods of public “education” is through drain stencilling, whereby environmental messages and in particular messages relating to stormwater, are painted on drainage pit or side entry pit lids, using prepared stencils. In the Wimmera, we have sets of stencils with generic messages, and stencils that have been prepared specifically for use in certain towns or shires. General messages could be one like “Pollution is not a Solution”, while a more specific message is “All Drains lead to the Lake”. Drain stencilling is very involving for students, who see the activity as practical and interesting, involving for local authorities who have to approve the process and also by inference become part of the activity itself, and the community who enquire about groups of brightly-clad students (in protective vests) working in groups around the town. It has always been useful and inclusive to involve a local councillor in the initial phases of drain stencilling work.

A one-off outcome, which could be replicated in many ways, was the production of a video around stormwater by Apsley Primary School, which was successful in a Waterwatch Photo/Video competition. This video demonstrated stormwater movement in Apsley township, and highlighted problems (in particular greywater) and some possible solutions which could be easily implemented. The video has been used as a stormwater teaching resource since its production.

Other outcomes are possible – but usually drain stencilling and/or a local education program through prepared information is usually the extent to which schools usually wish to go.

STORMWATER EDUCATION IN THE COMMUNITY

The Process

It is less clear what direction is required to successfully present information and provide a knowledge base and understanding of stormwater in the community setting. The impetus/motivation for community education may result from work with local government, from the direction taken by local community groups, and as an extension of work done in schools. Hopefully, some of the work with students does find its way into the home and influence parental thinking on stormwater issues, or there can be community-specific activities that provide an opportunity.

In approaching community outcomes, you need to have thought out what reasonable actions are possible from working with particular groups, and remember often, things do not happen in a hurry!

Pre-planning will determine what groups to approach and how they can be involved. Obviously, there needs to be some common interest in achieving gains in stormwater management.

Because some, at least, of expected activities may be focussed on town infrastructure, such as drain stencilling on drains and side entry pit lids, it is necessary and desirable to seek local government advice and permission

early in the process, and this may also provide opportunities for councillors and staff to be involved and to be seen as being pro-active.

Some Examples in Action

Kaniva Rotary Club became aware of water quality monitoring taking place at the local wetlands, a facility for which they have joint responsibility. This led to an invitation to speak at a meeting, where it was possible to focus on monitoring results and what it meant for infrastructure development and treatment regimes at the wetlands. For many members, the concept of “water quality” in a wetland had not been considered before.

Desert Fringe Regional Waste Management Group were officially opening waste and litter facilities at the Kaniva Town Wetlands. It was decided to integrate a town stormwater and wetland tour into the program for the day. Interested individuals, councillors and shire personnel were bussed around Kaniva and given an introduction to stormwater movement and management that was new to many. This was followed by a tour of the wetlands themselves, with Rotary Club members able to explain some of the landscaping features of the area.

Waterwatch, DSE, West Wimmera Shire and local management groups have been negotiating for years to develop a town wetlands in Goroke, in order to improve a current eyesore (stormwater drains). The plan is for a more aesthetically pleasing area which has a practical function – the storage and treatment of stormwater. The project, which has finally attracted some funding, has been generally well accepted, but some local consultation issues still have to be dealt with.

Facilities and infrastructure in Horsham provide a great learning environment for adult (as well as school) groups. A range of groups have been introduced to the “wonders” of stormwater based around Horsham facilities, including walking groups, older adult groups, learning groups and people involved in local festival events such as the “Art Is...” Festival. Education has occurred in the context of stormwater flows into the Wimmera River, the function of litter traps, stormwater storage and pre-treatment, the workings of artificial wetlands and water quality issues in the river and wetlands. The Horsham Weir Wetlands, an artificial wetlands constructed by Horsham Rural City Council, has been an important learning environment for many groups and individuals.

A similar learning environment has been available in Warracknabeal for many years, where stormwater flows into the local section of the Yarriambiack Creek at several points. This has provided an important community focus for learning about stormwater and its impacts, especially through the local Creek Committee.

Community programs such as a combined agency school holiday program has also provided stormwater education experiences. The western Wimmera catchment “Wild Games in the West” (a program run during school holidays at different times in different locations) has catered for stormwater education at

various times. These activities have included stormwater mini-walks, litter observation, the use of ponds in stormwater management, even finding out how a litter trap works. While Waterwatch or other agency staff can conduct such an activity, it is an opportunity to use council staff with some expertise in the area.

PRACTICAL OUTCOMES OF STORMWATER EDUCATION

As expected, results in this area can be very mixed. Like many programs involving elements of education and community take-up of ideas, it is difficult to quantify. Focussing on “real” outcomes, there have been some notable results:

- a further settlement pond, improved underground drainage and proposals for a litter trap and grassed swales at the Kaniva town wetlands. The issue of in-stream plant diversity has yet to be addressed. West Wimmera Shire is also giving attention to the design of new kerbing around the town.
- difficult-to-manage areas of the proposed Gorokey wetlands will be covered to enhance management and provide a better base for wetland development. Funding has ensured a treatment regime for Gorokey’s stormwater, ultimately providing a more aesthetically pleasing town facility. Issues of local acceptance have to be addressed.
- Hindmarsh Shire Council has initiated several components of stormwater management into the main drain that feeds Nhill Lake. Despite improved stormwater management, water quality continues to be poor, suggesting the need for a broader education program.
- drain stencilling activities have been extended to most towns in the western Wimmera and to other parts of the Wimmera as well – Edenhope, Kaniva, Nhill, Jeparit, Horsham
- Horsham’s Weir Wetlands has become a model for stormwater treatment and education for the area, with new housing estates required to construct some form of wetland or treatment regime relating to each development.
- litter traps have been installed in nearly all the stormwater outflows into the Wimmera River in Horsham.

Probably the most impressive outcome, but the most difficult to assess, is the hundreds of students and the many community groups that have been part of some form of stormwater education in recent years. While impressive, there is a long way to go yet.

RESOURCES

Drawings , posters, pamphlets and models
Local field work photos as a school/community resource
Stencils used in drain stencilling activities

References

“Stormwater Education Manual”, Waterwatch Victoria 2003