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Who is Watching our Water?
Waterwatch Australia

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SUMMARY: Waterwatch Australia is a national community waterway monitoring program currently operating in every State and Territory throughout Australia. Waterwatch was initiated by the Federal Government in recognition of a growing concern for water quality by the Australian people, triggered by major issues such as salinisation, clearing of riparian vegetation and blooms of blue-green algae. It was recognised that these issues reflect a much broader problem; this being the declining health of catchments throughout Australia. In the wake of these significant impacts, the Australian community has developed a strong impetus to explore and address the issue of catchment degradation. Through monitoring their local waterways, communities are geared into action to address water quality issues and work together to protect and rehabilitate waterways. Waterwatch Australia is a national umbrella program overarching the State and subsidiary programs which include Waterwatch Victoria, Streamwatch Victoria, Waterwatch SA, Ribbons of Blue in WA, Waterwatch NT, Waterwatch QLD, Streamwatch NSW, Waterwatch ACT and Waterwatch Tasmania.
As outlined in the Waterwatch Strategic Plan, the Vision for Waterwatch Australia is "Healthy Waterways" and the Goal is for "community groups and individuals to be active in the protection and management of waterways".

MAIN POINTS OF THIS PAPER

- Waterwatch Australia is a national community waterway monitoring and environmental education and awareness program operating in every State and Territory in Australia;
- those involved in Waterwatch build pictures of the health of their waterways and catchments through a variety of biological surveys and chemical tests
- the program seeks to create links within communities, between local and State government, school children and their parents, the business sector and other community organisations such as Landcare, Coastcare and Catchment Management Committees.

1. INTRODUCTION

As the flattest and one of the driest continents on the earth, the health of Australia's river systems, our creeks, our billabongs, flood plains and wetlands is vital to the well being of all Australians. The impact of European settlement on Australia's river systems has been severe. Many river systems are suffering from environmental stress due to unsustainable levels of water extraction, destruction of aquatic and riverbank habitat, weed growth through nutrient enrichment and rising levels of salinity, silt and pollutants. The way we treat our natural assets must change and, as community members, we must learn to tread lightly and take responsibility for what ends up in our waterways.

The concept of managing the total environment in an ecologically sustainable way is not new. Water quality provides an excellent indicator of environmental "health" and can help to direct the energies and actions of concerned communities. Species such as frogs, fish and waterbird, can indicate declining water quality, and monitoring of these animals can help communities to pin-point problem areas within a catchment.

Waterwatch Australia is a national community waterway monitoring and environmental education and awareness program operating in every State and Territory in Australia Programs such as Waterwatch are hugely successful at reaching the broader community and informing them about the need to protect the quality of our water. We need to be aware and inform the public that everything we feed into our drains, our sinks, our gardens, our streets and our paddocks ends up in our streams and lakes.

The impact of the ongoing abuses to our water resources are felt by the natural environment as much as by human populations which need clean water for drinking, household purposes, primary production and recreation. In parallel to the growing awareness about waterway health, we are experiencing an increase in community participation in environmental conservation and management. The general public are becoming more aware of their opportunities to be involved in environmental management and community consultation opportunities. They are becoming more active in the nomination of significant wetlands, community members are encouraged to have greater

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input into local Planning Scheme reviews and there is increased community involvement in the protection, monitoring and management of our waterways and wetlands.

As a result of growing community concern about water quality and catchment issues, the Waterwatch Australia Program has developed and is now a network of more than 50,000 people, regularly monitoring over 4000 sites across Australia.

Waterwatch is about "*communities caring for catchments*"; it is an environmental education and awareness program, that promotes water quality monitoring to create an ownership ethic for catchment wide land and water management by the Australian people. From its inception, those involved in Waterwatch have built pictures of the health of their waterways and catchments through a variety of biological and chemical tests they perform. Some of the physical and chemical parameters that are tested include; pH, turbidity, dissolved oxygen, temperature, salinity, dissolved solids, phosphates, nitrates, faecal coliforms. Surveys to compliment the chemical testing include macroinvertebrates and river bank vegetation assessments. Over the years, Waterwatch has grown to involve more than just awareness raising and water quality testing and is now entering a new era of action to find solutions and rectify waterway problems (Chalkley *et al*).

2. THE HISTORY OF WATERWATCH

The Waterwatch Australia Program was conceived in 1992 following a workshop organised by the Federal Government and involving government agencies, community groups and individuals. The Program has developed from a goring community concern about water quality that has been triggered by major issues such as salinisation, blooms of blue-green algae and the destruction of aquatic and riverbank habitat.

From largely independent programs operating in three States in 1992 Waterwatch Australia is now established in all States and Territories (although called Streamwatch in NSW and Ribbons of Blue in WA) and is operating in a coordinated and strategic manner. Catchment by catchment expansion is being carefully planned by State/Territory-based steering committees which have strong community representation.

Over the first three years of the Program, the Commonwealth committed $3 million, this figure has now grown to over $2.6 million for the 1998/99 financial year alone.

At present more than 120 regionally-based coordinators are supported to varying degrees by Waterwatch Australia. These community employees are training others to get involved in Waterwatch and to "read" the results of their monitoring so they can design projects to tackle the problems they detect. The Program has evolved to include a State Facilitator in each State and Territory and a National Facilitator in the National Office which is based in Environment Australia in Canberra. The Waterwatch Australia Steering Committee has also been established to provide umbrella direction and support for the Program and to make Program policy decisions on behalf of the network.

The Commonwealth's Natural Heritage Trust aims to increase the level of community understanding and involvement in waterway management and rehabilitation. Waterwatch Australia has been enormously successful in encouraging communities throughout the country to be actively involved in monitoring and managing their local waterways.

Waterwatch Australia has been enormously successful in a variety of ways. Since 1993 it has grown from 200 groups monitoring in 16 catchments, to nearly 1800 groups monitoring in more than 150 catchments. It is estimated that at present there are over 4000 Waterwatch sites being monitored by over 50,000 people from across Australia.

3. THE NATURAL HERITAGE TRUST

The Natural Heritage Trust represents a new era in environmental responsibility, enabling every Australian to be involved and bringing together the efforts of individuals, communities and governments to target our environmental problems at the source. Through programs such as Waterwatch, local communities now have a greater opportunity to participate in conservation by identifying sites for environmental action and applying for funding to conserve, protect, monitor, rehabilitate and better manage local areas.

The Natural Heritage Trust commits $1.25 billion to environmental action, funding projects that directly address pressing environmental issues whether they be at the local, regional, state or national level. The funds of the Trust are delivered through a number of initiatives that have been designed to address biodiversity and sustainable agriculture. The Waterwatch Australia Program is funded under one such initiative funded by the Trust. (Edgar, 1998).

Over the past two years, the Federal Government's investment in Waterwatch projects has been used to support over 80 projects across Australia, the vast majority of which continue to be community based.

Proponents of Waterwatch state and regional programs and other types of Waterwatch activities are required to submit project applications under Natural Heritage Trust Guidelines published each year. Information about funding can be obtained from the National

Waterwatch Office or from the Waterwatch website **www.waterwatch.org.au**

4. WATERWATCH PROGRAM OBJECTIVES

Waterwatch Australia coordinates and supports community monitoring of waterways, with a focus on water quality and aquatic biodiversity. Being a community based program, Waterwatch can deliver outcomes that governments alone cannot achieve. Some of the objectives that Waterwatch is working towards include:

- an awareness and understanding of the importance of healthy waterways and the relationship to land uses within the catchment,
- community waterway monitoring,
- community involvement in planning and action to address waterway and catchment issues,
- effective partnerships between all sectors of the community working towards healthy waterways,
- support for the Waterwatch Australia network.

Some of the goals of the Program include:

- raising community awareness of the consequences of our actions on water quality
- improving community understanding of the importance of planning and managing for catchments
- instilling the ethic of the wise use of water resources
- providing communities with information and resources to implement on-ground actions to improve water quality
- providing strong encouragement to Governments to respond to water quality issues and
- maintaining a large monitoring network.

Waterwatch seeks to create links within communities, between school children and their parents, local government, the business sector and, where possible, Landcare and other community organisations. The principal form of Waterwatch support is to partially fund State and catchment-level facilitators who orchestrate expansion of the program on the ground, provide training, infrastructure support, feedback and create links between participating groups within each catchment. Where possible, community groups are encouraged to raise their own funds, or gain sponsorship from local government or the private sector. In doing so they will establish important community links and ownership of the projects at the local level.).

5. TECHNICAL STANDARDS

With potentially over 50,000 people in the field collecting waterway monitoring data, efficient systems and standards have been developed by the Waterwatch Program in order to record and interpret this information. Community participation in data collection for educational and management purposes will only be sustainable if the data is accurate and of a high value. The objective is to collect high quality data that can be used by the community and governments to guide management decisions.

Waterwatch encourages correct procedures and techniques for the collection of data. Whilst it is not always necessary to collect data to a fine degree of precision, it is important that the methods used result in accurate, reliable and good quality data. Data must also be collected at the level of precision for the purpose for which it is to be used. Not all Waterwatch groups are interested in collecting information to the same standard. Waterwatch recognises that with groups of different ages, different technical abilities and groups with different objectives, there will be different standards in the collection and analysis of data.

Waterwatch has a strong environmental education focus and has targeted the involvement of the general community as well as school students in the program. Primary school involvement in Waterwatch may be primarily to explain concepts such as protecting and measuring water quality and a general awareness of catchments. In this case it is the educational aspects of collecting the data, rather than the data itself, which is important. For more senior classes and university students it might be more important to collect more scientific data, where monitoring is incorporated into the curriculum. In some cases, students conduct regular physical and chemical testing in conjunction with local governments, water authorities or catchment management boards whilst others are involved in macro-invertebrate surveys or biological research projects. (Chalkley *et al*).

As legitimacy of the data for use by the scientific community is important, quality control measures have been introduced to the Waterwatch Program to ensure a high standard of data collection. Those groups that are concerned with collecting credible data go to great lengths to ensure that their data collection technical standards are of a high quality and that the data is in some way validated.

The Waterwatch Australia Steering Committee is currently finalising a National Technical Manual to provide standards, techniques and equipment for collecting data on a number of water quality parameters, as well as biodiversity parameters such as aquatic macro-invertebrates and riparian vegetation.

Having access to a Waterwatch database on which to store data is a growing component of the program. The most important level of data sharing and data ownership is among local groups and at the regional level. A data storage system has been developed on the basis that it is the community who own the data, and it is the community who need to be able to analyse and interpret it.

6. SELECTING WATERWAY MONITORING SITES

Waterwatch monitoring sites are selected by the community groups involved in Waterwatch, often in conjunction with their Regional Coordinator. In some circumstances, sites are chosen by a community group as a result of a local issue or water quality concern. Some sites are selected as a result of advice from a Catchment Coordinating Committee, a local government organisation or a State Agency.

The Waterwatch network develops monitoring regimes to measure two types of impact:

- point source pollution and
- nonpoint source pollution.

To measure point source pollution, monitoring sites are located upstream and downstream of a known source of pollution into a waterway such as a stormwater drain or a waste water outlet. To measure nonpoint source pollution, monitoring sites are located strategically throughout the catchment or upstream and downstream of a waterway to enable data from the chosen parameters to be collected from throughout the catchment. A nonpoint source monitoring program shows patterns and trends in the context of the known issues within the catchment.

7. WATER QUALITY INDICATORS

The current key set of water quality indicators that is recommended by Waterwatch Australia, is internationally accepted as a set that reflects changes in water quality, resulting from land use practices and disturbances within a catchment.

The underlying rationale behind Waterwatch monitoring is to use water quality as the main indicator of catchment health - based on the premise that everything that happens in the catchment is reflected in the water.

Figure 1 shows the range of chemical and physical parameters and biological indicators that are tested by Waterwatch groups around Australia. Not all groups test every one of these parameters and some groups test to a higher standard than others.

Figure 1: Waterway Monitoring Parameters used by Waterwatch Groups

Physical and chemical water quality parameters	Biological habitat assessment
Turbidity	Macroinvertebrate abundance and diversity
Stream conductivity	Bank vegetation
pH	Verge vegetation
Dissolved oxygen	Bank erosion and stability
Temperature	Stream cover
Total Dissolved Solids	
Total Phosphorus	
Reactive Phosphate	
Nitrate (Nitrogen)	
Flow	
Faecal coliforms	
Chlorophyll a	
Groundwater conductivity	
Groundwater level	

8. HOW IS WATERWATCH DATA USED?

Waterwatch is not an isolated monitoring program. In most cases the volunteer monitoring is driven by a particular need for waterway monitoring information. Requests for information may come from local government authorities, catchment committees, water authorities and State governments.

People on the ground react to local environmental concerns in the waterways or wetlands in their area. The information is collected and feeds into the system through the regional infrastructure. The Waterwatch network feels empowered to take action and the local authorities have waterway monitoring evidence to work with.

Relevant stakeholders get together to address the issues raised by the data collection. In some cases a clear relationship between the indicator and the landuse or disturbance becomes clear. In other cases it is harder to trace the cause, but the motivation has been generated to discover the causes of the water quality problem. In circumstances such as this, water quality may be used to determine the health of the catchment.

In some cases, the waterway monitoring results are printed in the newspaper. This allows for the wider community to keep an eye on the changing test results and paints a very real and accessible picture of what is happening in the local waterways. Other ways in which

Waterwatch data is currently used includes:

- State of the Environment Reports at local, State and Federal Government levels,
- Environmental Impact Statements,
- Catchment Management Reports and Strategies,
- to identify and priorities where community action is required,
- as a component of School curriculums
- in Ramsar Wetland Reports
- local planning studies.

Some Waterwatch groups currently collect data that feeds into State and national scientific monitoring programs. For this reason it is important that Waterwatch provides the training and capacity to collect credible data. Unfortunately there are those scientists who continue to question the value of community collected information, yet the scientific community comprises only a small percentage of environmental monitoring in Australia. The community currently collects data that provides a more extensive geographical coverage, and allows for significantly more people to be involved who can translate monitoring into action.

There are currently a number of government and scientific monitoring programs utilising the data that Waterwatch provides.

A Case Study
Use of Maroochy Waterwatch Data

Susie Chapman is the Regional Waterwatch Coordinator for the Maroochy River on Queensland's Sunshine Coast. With Australia's fastest growing population, pressure has been put on the remnant native vegetation, agricultural land and local waterways in Maroochy Shire. This makes it a critical area in which to monitor the water quality, undertake biological surveys and test other waterway parameters.
Maroochy Waterwatch involves the community in monitoring and identifying potential water quality problems as well as, using the waterway monitoring data to seek solutions and manage water resources co-operatively with other water users and regulatory authorities.
An important achievement for Maroochy Waterwatch has been official State Government recognition of the veracity of their data. When water quality tests undertaken by the group were proposed to be used by the Department of Transport for an Environmental Impact Statement, sections of the Queensland Department of Environment were sceptical about the use of the community collected data.
Susie Chapman could see that after several years of monitoring, government acceptance of the data was a challenge that her group would have to face or the enthusiasm and interest of the Maroochy Waterwatch participants would be lost. The group boasts 55 volunteers with skills ranging from agricultural scientists, teachers, farmers, social workers, surveyors, a fish breeder and environmental scientists. Susie recalls, "If our data wasn't going to be accepted by the Department of Environment, the Waterwatch volunteers would query why we are testing at all!".
The credibility of Waterwatch was on the line, and the group was put to the test when the Queensland Department of Environment replicated scientific tests of the Waterwatch samples and data. The results came in with as little as a one per cent difference. It was an excellent outcome for Waterwatch and as a result, the Department of Environment agreed to the use of the data in the Environmental Impact Statement (EIS). This was the first time that community collected data had been used as part of an official government EIS in Queensland. (adapted from Snapshot '97 - News from Around Australia).

9. WHAT MAKES THE WATERWATCH PROGRAM SO SUCCESSFUL?

The success of Waterwatch can be measured in many ways. The fact that the Program is becoming more widely known and that community attitudes to water quality, waterway use and catchment management are becoming more wide spread may be partly attributed to Waterwatch. The program now operates in every major metropolitan centre across Australia as well as in the bush, this being another indicator that waterway environmental education is moving beyond the school setting and into the broader community. This spread of Waterwatch creates links and mutual understanding between urban and rural dwellers to promote greater cooperation and on ground action.

Strategies exist as part of the Waterwatch Australia program which contribute to achieving the objectives of the program and help to make the program so successful. Some of these strategies include:

- the development of State and National Technical Manuals to guide and teach Waterwatch volunteers about waterway testing techniques,
- National Waterwatch guidelines, policies and procedures that direct the Program and ensure consistency and a high standard of delivery across the country,
- the role of State Facilitators and Regional Coordinators to provide technical support, training, advice and maintain enthusiasm and motivation,
- the standardisation of sampling, calibration procedures, units and data entry across Australia, which in turn ensures the data collected is of a high standard,
- national unity within the Program,
- providing the community with the capacity to engage in decision making processes and
- confidence in Waterwatch data so it may be used by government agencies and the private sector.

10. INTERNATIONAL LINKAGES

Community based waterway monitoring originated in the United States. Through the actions of Professor Bill Stapp, the Global Rivers Environmental Education Network (GREEN) was established, and now operates in 120 countries around the world. In 1995 an international GREEN conference was held in Sydney, with a number of the GREEN coordinators coming from countries in Africa, Asia and central Europe. In many of these countries support for monitoring is strong, but government support is unfortunately limited. Although inspired by the GREEN program, Waterwatch has taken the GREEN example and developed a highly effective, successful and well supported Australian community waterway monitoring network.

Another similar international program is the River Watch Network which operates in countries such as the United States, Canada, Mexico and Hungary. This network is a national and international nonprofit organisation that works with community groups to create and sustain citizen based river monitoring and protection programs.

Other countries in the Asia-Pacific region have shown an interest in how Waterwatch operates, and how it was established. There is also a strong demand for technical manuals and technical equipment. Many of the practical tools used by Waterwatch, such as the turbidity tube, have application in places where community based action may be the only feasible option for countries wishing to monitor water quality.

Waterwatch Australia has the potential to provide a model for community based water quality monitoring around the world. The guiding principles of community awareness and ownership, regional facilitators supporting community groups, and strong technical support through information exchange, training and assistance, have relevance and applicability elsewhere in the world where declining water quality is a serious concern.

11. CONCLUSION

It is important to look at the challenges and opportunities which Waterwatch faces to have a long term future. All programs need to continue to plan for the future, to ensure they remain relevant to government and community expectations. Some of the challenges and opportunities facing Waterwatch include:

- meeting the demand from the community to participate;
- maintaining and increasing resources to the program;
- continuing to provide strong support to the Waterwatch Network;
- maintaining a strategic direction for the program;
- establishing effective communication;
- developing technical standards, equipment and manuals;
- promoting Waterwatch internationally.

Australia is a big country, it has catchments that encompass deserts, mountains, tropical and temperate rainforests and wetlands, prime agricultural land and large cities. The condition of these catchments varies from wild and pristine, through to highly modified and polluted. It is an enormous task in a country so vast and diverse as Australia, to preserve the pristine, manage the impacts and reclaim the polluted.

The very exciting aspect of Waterwatch Australia is the true community nature of the program resulting in the rich diversity of activities, linked together under the Waterwatch umbrella. Inherent in this strategically developed network is strong community representation at all levels and across the nation (Gowland and Foster, 1997).

Ultimately we must remember that everything that happens in a catchment can have downstream effects, and that all communities within each catchment must therefore work together, be they rural or urban, to correct the problems. We can only protect Australia's natural environment if the whole community is involved in the management of our land and water. In line with this vision, Waterwatch Australia provides a premier environmental education and awareness program for all Australian communities to achieve a harmonious relationship with, and respect for, our unique natural environment.

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