

WATERWATCH SA ESTUARINE MONITORING PROJECT – FROM TRIAL TO TRIBULATION?

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ABSTRACT

In 2002-3, the South Australian Environment Protection Authority (EPA) funded the Waterwatch SA Community Estuarine Monitoring Project. Delta Environmental Consulting were contracted to produce an Estuarine Monitoring Guidance Manual in consultation with Waterwatch staff. Community groups and schools across Adelaide estuaries were then invited to trial some of the core monitoring activities. EPA funding also secured equipment and training for the trial participants.

At the end of the trial period, a number of challenges were identified. What was the best way to translate a comprehensive technical manual into user-friendly instructions? How would the Waterwatch network resource further equipment? How could we increase public awareness of the importance of healthy local estuaries to those who may not be interested in monitoring activities? With multiple parameters and monitoring plans to suit each group's interest, how could the data be interpreted? Would government departments and catchment water management boards use the data? How would the project be evaluated?

To date, groups are using standard or advanced monitoring kits with either the manual or instruction cards to guide them. Grant funding has enabled Waterwatch SA to purchase more equipment and offer training and development sessions for interested community members. Colour brochures have been produced to showcase the recreational, economic and environmental values of regional estuaries to the general public. Can we meet the other challenges?

INTRODUCTION

The establishment of an estuarine monitoring project in South Australia started in 2002, with requests from community groups that were monitoring estuarine environments using a freshwater kit in the KESAB Patawalonga and Torrens Waterwatch (KPTW) program and the Onkaparinga Waterwatch Network (OWN). During that year a series of workshops were held with community members, Waterwatch staff and professionals in the coast and marine field to discuss the potential of an estuarine monitoring project. Participants worked through potential monitoring parameters and provided feedback on factors such as practicality, simplicity, safety, educational value, reliability and impacts of estuarine features.

In February 2003 the Environment Protection Authority (EPA) put out a tender for the development of an estuarine monitoring structure and resource manual outlining the practical aspects of estuarine monitoring for regional Waterwatch programs in the state. Delta Environmental Consulting, an independent SA firm specializing in coastal ecosystems, wetland management and water quality assessment, won the contract. Using the outcomes of the 2002 workshops, along with a literature review of existing community estuarine models from Australia and overseas (Cook and Coleman 2003), Delta produced a draft guidance manual. A number of requirements were stipulated for the manual and the accompanying equipment kits – the manual had to have clear educational value, be easy for community

groups with no scientific background to use and document quality assurance/quality control standards, and each kit had to be less than \$1000 in total, minimise production of polluting wastes and be suitable for use in the estuarine environments of the Onkaparinga Estuary, Port River and Barker Inlet Environs. During the development of the monitoring framework, Delta were required to train and trial the core monitoring activities with two to three community groups from the three metropolitan Adelaide Waterwatch programs (Coleman 2003).

ESTUARINE MONITORING

In July 2003, after reviews and editing by staff of Waterwatch SA, the EPA and the Coast and Marine Branch of the Department for Environment and Heritage, the Waterwatch South Australia Estuarine Monitoring: Guidance Manual was released in draft form, and the pilot monitoring program was launched with three groups, an individual, a school group and a community group in the Port River Estuary. Equipment to make up these three kits was purchased by the EPA. The groups headed out in early August to collect their first estuarine data, and both participants and staff reviewed the process for ease of use and data management.

While all concerned felt more at ease having used the kit in the field, a few issues arose:

- Some groups were not monitoring in deep enough water to use a Secchi disk so needed to revert to a turbidity tube.
- Some of the conversion tables in the instructions were difficult to understand and some were confusing.
- A couple of the groups also found the record sheets needed to be clearer and simpler.

In addition, the full estuarine kit was difficult to handle, particularly for those groups not testing all parameters. After this review, Waterwatch produced new record sheets (Figure 1), instruction cards and a basic and advanced kit. Refer to Table 1 for the parameters monitored.

Community groups are more likely to have the time and skills to carry out a comprehensive monitoring plan, so currently they are the ones with the 'advanced' kits – containing a full set of equipment and resources. One dedicated community individual, monitoring on Crown Land, has received the support of the South Australian Department of Environment and Heritage who funded Delta Environmental Consulting to create a comprehensive monitoring plan and regime for his site, which includes additional training in methodologies not covered by the Waterwatch SA pilot. In 2005 it is planned that all school groups will be encouraged to monitor a set group of parameters to provide more meaningful interpretation across the region. Community groups are usually monitoring for their own purposes and are less likely to rely on having other groups' data available for the aims of their monitoring programs.

As the pilot continued in 2004, with monitoring groups now well established in the Onkaparinga and Port River Estuary, one of the outstanding issues was the data – how to store it, how to interpret it, how to feed it back to the groups involved and how to promote it to other organisations. Storing and managing the data was not as easy as entering it into the Waterwatch Australia Data Management database (WADM), because not all of the parameters had been built into the program, developed essentially for freshwater systems. As a result, the data is currently stored in Excel.

Interpreting the data was also difficult because of the range of tests available in the kit. To accommodate the needs of the monitoring groups, we didn't require a standard suite of tests from groups for any given monitoring day, unlike the consistent five for freshwater groups,

which meant that we may only receive one data point for a given test per event. As we initially had only three estuarine groups, we did not have the time to produce a feedback map exclusively for them, and interpreting single data points was very difficult. As we didn't want them to feel isolated or their data not valued, their data was being included on the feedback maps for their sub-catchment, but not compared to the other monitoring groups as they all use freshwater kits. This is still not an ideal situation. We would have liked to have produced a map which encompassed all three estuaries but had difficulties with the scale of the map and the lack of data points. In 2005 we intend to provide all estuarine groups across Adelaide with a quarterly newsletter, summarising results from each region and including a map for their specific estuary, with the option to receive maps from other estuaries. Better interpretation of the data could result from a number of options: more monitoring groups, groups able to monitor more than six times a year or data from other agencies and organisations being made available for comparison. The first option is our most likely avenue at this stage, although Integrated Natural Resource Management reforms may promote more information sharing.

We are happy to share our estuarine data with any organisations or individuals interested in it and in the last year we have had interest from a number of groups, including the Barker Inlet Port Estuary Committee, the Conservation Council and the Whale and Dolphin Conservation Society. The quality of scientific data is always of interest to potential users and is no different in this case of community-collected estuarine data. Delta Consulting were required to document the quality assurance (QA) and quality control (QC) standards for the equipment and methods to ensure data of a known quality is obtained through use of the kit. Determining whether our groups are collecting data of a known quality has been achieved through their participation in the EPA Data Categories for Community Water Monitoring for some of the parameters shared with freshwater monitoring groups.

The Data Categories pilot ran in 2004, and groups chose what level of training and QA/QC checks they would like to undertake, ranking them as either general, standard or advanced data categories. All groups receive annual training for their monitoring category, groups in the last two categories are required to rinse and calibrate their equipment each time they sample (general groups are also encouraged to carry out these steps) and to complete one or two 'mystery' (known standards) solution testing events each year. In 2005, estuarine groups will complete mystery solution testing for estuarine parameters such as alkalinity and ammonium. This will allow us to promote estuarine data of a known quality (confidence intervals) to potential users.

ESTUARINE RESOURCES

In order to raise awareness of the values and impacts on estuarine environments in the general community, not just those interested in monitoring, the three Waterwatch programs sought external funding and assistance to produce a range of estuarine resources. In 2003 Northern Adelaide and Barossa Waterwatch (NABW) was supported by its stakeholders in the development of series of four A3 identification and information charts appropriate for use across the Greater Adelaide estuarine environments. They cover birds, marine macroinvertebrates, plants (sub-tidal to above high water mark) and terrestrial invertebrates found on estuarine plants.

In the same year, OWN, in conjunction with Reefwatch, was successful in securing an Envirofund grant to develop educational resources for the Onkaparinga catchment. They produced a series of four colour photo identification charts for the birds, macroinvertebrates,

plants of the estuary and plants of the sand dunes. These charts have been designed for school, community groups and individuals to use in class or at the estuary. Distributed to local schools at teacher training sessions, the charts are available to local community groups and individuals participating in the Waterwatch program, and for loan to others. Supporting resources have been developed so that schools can run estuary field trips without Waterwatch staff assistance.

This grant also supported the production of a brochure for the Onkaparinga Estuary which was launched in late 2004 and has been warmly received by local libraries, tourist information centres and council. Local community groups, some of whom monitor the estuary, were consulted and assisted in the production of the brochure, along with the Onkaparinga Catchment Water Management Board and Adelaide Hills Council. An initial print run of 1000 copies remains in demand. KPTW and NABW will use the OWN template to produce similar brochures for estuaries in their region. The aim is that this information about local estuaries, their values, uses, impacts on their health and the positive projects that individuals and groups are working on, will reach a wider audience through non-Waterwatch outlets.

In May 2004, we were successful in gaining two more Envirofund grants to expand the equipment, resources and training opportunities across Greater Adelaide. A grant coordinated by KPTW covered the purchase of six new monitoring kits to supply new groups, some biological monitoring equipment, brochure and ID chart production and two full-day professional training workshops for participants in the estuarine monitoring program. In the NABW region, a separate grant engaged the services of Delta Consulting to create a training package primarily for volunteer guides at the Middle Beach Sapphire Trail, but which could be used in other Greater Adelaide estuaries. The training modules include group facilitation, OHS&W, legal issues, estuarine plant communities, food webs and both the Indigenous and European histories of the area. The volunteers will then run tours, education sessions and monitoring programs with visiting schools, individuals and community groups. The package is due for completion by February 2005.

CONCLUSION

Interest in the estuarine activities and resources of Waterwatch SA continues to grow and the trial phase is soon to be over. This year will see an expansion in the number of monitoring groups, particularly in the northern Adelaide region. In the Port River Estuary we will be running estuarine field days for visiting schools to raise awareness of the local area and of those working to manage it, as well as providing hands-on learning opportunities through monitoring activities and waste management. Some field days will be advertised during water quality monitoring weeks to ensure the data gathered will complement that collected by existing monitoring groups. In November, estuarine community days are planned for consecutive weekends in each region in the lead up to Coast Care Week. These events will be run by local community groups, schools and individuals, to showcase their work, and that of other organisations and agencies, in the understanding, management and protection of their estuaries. In 2005 interested groups will be able to receive training and resources specific to their area, brochures will be available to the local community at libraries and tourist centres and potential data users will have more data to choose from and more confidence in its quality. On our journey from trial to tribulation, we haven't quite made it home yet, but it is not far away.

REFERENCES

Coleman, P. (2003). "Draft Waterwatch South Australia Estuarine Monitoring: Guidance Manual". Delta Environmental Consulting, St Kilda, South Australia.

Cook, F. and Coleman, P. (2003) "Draft literature review: community estuarine monitoring programs." Delta Environmental Consulting, St Kilda, South Australia.

Figure 1. 2004 Estuarine Monitoring Data Sheet (standard)

KESAB Patawalonga and Torrens Waterwatch

**ESTUARINE MONITORING
Snapshot #1 Data Sheet
Wednesday March 10th 2004**



Date of sampling: Contact Person:.....

Name of Monitoring Group/School:.....

What sub-catchment do you test in?

- Port River West Lakes Barker Inlet

	Site Codes e.g. KES 090	---	---	---	Tide data:
Weather	Time				Last tide
	Water Temperature - °C				- height _____
	Wind - Beaufort scale number				- time _____
	Cloud cover - % coverage				Next tide
	Rainfall	<input type="checkbox"/> During the last 24 hours	<input type="checkbox"/> During the last week	<input type="checkbox"/> More than a week ago	- height _____ - time _____
Site Observations	Water Colour - colour chart number				Additional site observations. (eg. bad erosion, dolphins seen)
	Water Appearance Clear/Muddy/Scummy Milky/Foamy/Oily				
	Water flow No flow/Slow/Medium/Fast				
	Water Depth at sample location - metres				
	Water Clarity: Turbidity Tube, NTU OR Secci Disk, metres	_____ NTU _____ metres	_____ NTU _____ metres	_____ NTU _____ metres	
Parameters Tested	Ammonium (mg/L) Snapshot 1, 3, 5 only				Questions, comments, ideas
	Orthophosphate (mg/L) Snapshot 1, 3, 5 only				
	Alkalinity (mg/L)				
	pH				
	Salinity Hydrometer reading - Raw SG	_____ SG	_____ SG	_____ SG	
	Water Temp - transfer result above	_____ °C	_____ °C	_____ °C	
	Salinity - use conversion chart	_____ g/L	_____ g/L	_____ g/L	
Dissolved Oxygen - (mg/L) Snapshot 6 only					

Please clean all equipment after monitoring and return your results to KPTW immediately by:

FAX: 8234 7266

EMAIL: Log onto www.cwmb.sa.gov.au/kwc and go to the "Snapshots" section

POST: 214 Grange Road, Flinders Park, 5025

Table 1. Estuarine parameters monitored by Waterwatch SA groups.

Test	Equipment	Standard kit	Advanced kit
Water temperature	Glass thermometer	3	
Wind	Beaufort scale	3	3
Cloud cover	Estimate of % cover	3	3
Time of last rainfall	Tick box	3	3
Water colour	Colour chart	3	3
Tide data	Height and time	3	3
Water appearance	Observations	3	3
Water flow	Tick box	3	3
Water depth	Secchi disk	3	3
Water clarity	Secchi disk/ turbidity tube	3	3
Ammonium	colorimetric microtest (Indophenol blue)	3	3
Orthophosphate	colorimetric microtest (Molybdenum blue)	3	3
Alkalinity	acidimetric titration microtest	3	3
pH	pH strips	3	3
Salinity	Hydrometer/conversion chart	3	3
Dissolved oxygen	drop count titration microtest (modified Winkler method)	3	3
Saltmarsh vegetation	Transects		3
Mangrove expansion	Photopoints		3
Submerged aquatic macrophytes	Aerial monitoring (kite fitted with camera)		3