

SEEKING AND ARTICULATING LEARNING FROM THE DOING OF ENVIRONMENTAL FLOWS

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Adaptive Management underpins the implementation of Australia's Water Act 2007 so it is important to understand what Adaptive Management is and how to recognise it. 'Adaptive Management' describes managers learning from their actions to improve their future actions to achieve natural resource management goals. Adaptive Management is often perceived to have failed to meet its rhetorical promise. While institutional and cultural constraints may contribute to this, some of the perceived lack of adaptive management may reflect under evaluation and reporting of success. In this paper two examples of adaptive flow management in south-east Australia - one in the Mitta Mitta River in Victoria, the other in the Edward-Wakool River System in southern NSW - are examined. These two examples suggest that while there are examples where lessons from management have led to changes to practice, successful adaptive management is not necessarily obvious as the evidence is scattered across environmental water planning documents, environmental water use option reports, monitoring reports, and stakeholder committee minutes. Without some deliberate investigation and evaluation, it is difficult to judge the 'success' of an adaptive approach to flow management. Biophysical monitoring and evaluation are in place, but there is no equivalent large scale process for reflection on the social learning and change that may be occurring, and how this might inform future social and environmental decision making.

1 INTRODUCTION

Adaptive Management rhetorically underpins the implementation of Australia's Water Act 2007 and the environmental watering related to this Act, so it is important to understand what Adaptive Management is and how to recognise and evaluate it in practice. 'Adaptive Management' is a label for an ideal in which managers learn from their actions to improve their future actions to achieve natural resource management goals [1, 2]. Adaptive Management appeals to natural resource decision makers and practitioners because it legitimises continued action within complex situations containing multiple uncertainties [3]. A continuum of understanding of what 'learning from their actions' means has emerged, with a reductionist technical framing that focuses on the biophysical lessons from field experimentation at one end (e.g. [4]) to a constructivist social framing at the other (e.g. [5]).

For almost as long as Adaptive Management has been described as such it has been accused of failing to achieve its promise [6], apparently because of fundamental institutional and cultural constraints [7, 8]. Without downplaying the importance of these constraints, it is possible that some of the perceived failure of Adaptive Management reflects the way it is assessed and reported within the projects themselves. Perhaps the lack of clear frameworks to evaluate Adaptive Management [9] may be a factor, or maybe there is a broader issue with the capacity for evaluation with adaptive projects themselves?

In this paper two examples of adaptive flow management in SE Australia - one in the Mitta Mitta River in Victoria, the other in the Edward-Wakool River System in southern NSW - are examined briefly to better understand the processes of Adaptive Management, and how it can be recognised and reported. The authors are university researchers with an interest in adaptive management of water. Author Watts was the ecologist central to the variable flow trials in the Mitta Mitta River, and leads the Long Term Intervention Monitoring Project in the Edward-Wakool system (that is, monitoring of ecosystem responses to Commonwealth environmental watering). Author Allan, a social researcher, has explored the institutional arrangements in the two examples via focus group and individual interviews with agency planning and management staff. The following reflections are based on analysis of the interview data and related agency documents. The Mitta Mitta River example is

published in [10] and [11]. The Edward-Wakool research is in progress. A brief description of each example is provided below, followed by reflection on both to illuminate some aspects of evaluating adaptive processes.

2 VARIABLE FLOW TRIALS IN THE MITTA MITTA RIVER

Dartmouth and Hume Dams are operated as part of the River Murray System by the River Murray Division of the (now) Murray-Darling Basin Authority (MDBA). The Mitta Mitta River is used to ‘transfer’ water from Dartmouth to Hume Reservoir, primarily to support irrigated agriculture. When transfers are not required ‘minimum flows’ are released to the Mitta Mitta River, traditionally at constant flow rates. River operators on the Mitta Mitta River, working with university based ecologists, experimented with transferring consumptive water between Dartmouth Dam and Hume Dam using a variable hydrograph to reduce environmental impacts [10]. Through a series of trials much was learned about biophysical aspects of flows in the Mitta Mitta River, including that managed variable flows are ecologically beneficial when compared with sustained periods of relatively constant flows during both the filling and releasing modes of operation of Dartmouth Dam [11]. Spatial and temporal scale, and antecedent conditions, contributed to the degree and nature of these benefits.

As the Mitta Mitta River variable flow trials progressed, it became clear to the river operators and university researchers that they were undertaking active adaptive management, with a cycle of learning from a series of monitored and evaluated variable releases [12]. The university research team involved with the trials expanded to include a social scientist to facilitate reflection on the processes of adaptive flow management, as well as on biophysical lessons. The adaptive management was tightly bounded to operating in a relatively short stretch of river within existing operating rules, and within a small local community of farmers and recreational fishers. Within these boundaries, changes to the way consumptive water was transferred were developed and applied, to the benefit of the environment. The impact of the trials extended beyond the immediate benefit to the Mitta Mitta River environment, as lessons were incorporated into the broader system operation and water reform framework, including the system wide-review of River Murray Systems operations which commenced in 2007/2008 [10].

3 ENVIRONMENTAL WATERING IN THE EDWARD-WAKOOL RIVER SYSTEM

The Edward-Wakool River System is a complex of interconnected regulated streams, ephemeral creeks, flood runners and wetlands on a broad floodplain, intersected by a network of irrigation channels that eventually feed into the Murray River. The system supports a range of aquatic species and ecosystem functions, recreational fishery, irrigated agriculture and forestry. Environmental watering, with attendant monitoring and evaluation, has occurred in the Edward-Wakool system since 2010 [13]. While the action of environmental watering in this river system has general support, a range of stakeholders want to be more involved in the planning and decision making [14], a desire that may at least partially have been met by the formation in 2014 of the Edward-Wakool Stakeholder Committee [15].

Anecdotally there is effective adaptive management of environmental watering in the Edward-Wakool River System, but the evidence for this is spread across environmental water planning documents, environmental water use option reports, monitoring reports, and stakeholder committee minutes. There is some documented evidence of learning about selected biophysical impacts of watering events via monitoring of the events and, importantly, that the results of that monitoring are influencing further watering events. Other evidence of learning and behaviour change, however, exists in the verbal discourses and corporate knowledge (often undocumented) of agency staff and other stakeholders. There is currently no single document that describes, with evidence, the process of adaptive management, nor the specific lessons that have led to practice change. Biophysical monitoring and evaluation are in place, but there is no equivalent large scale process for reflection on the social learning and change that may be occurring, and how this might inform future social and environmental decision making.

4 REFLECTIONS ON EVALUATING ADAPTIVE FLOW MANAGEMENT IN THESE EXAMPLES

In neither example presented in this paper was adaptive management immediately obvious to casual observation because the key stakeholders were compartmentalised and focused on their core practice (which, after all, is their brief and just what they should be expected to do). In the Mitta Mitta example, the success of the adaptive processes became clearer when the actors, guided by a social researcher, specifically sought evidence of adaptive management, and were able to combine multiple strands of written and anecdotal evidence from a range of stakeholders. The authors are currently undertaking a similar exercise of drawing together written and interview evidence of adaptive management practices in the Edward-Wakool River System example, with preliminary results to be presented at this conference in February.

Does it matter if Adaptive Management is not recognised as such, from the outside, away from the effective operation occurring? We believe so; firstly, if adaptive management is not recognised it is not possible to reflect on how well it is working and how it could be used better to enhance the overall outcomes of the watering or water delivery. The example from the Mitta Mitta demonstrates this point clearly. Reflecting on the adaptive management of water delivery to enhance environmental outcomes while meeting operational needs enabled River Operators to discuss and clearly delineate project boundaries. Reflection showed where boundaries were constraining River Murray Systems operations. In response, mechanisms for improved communication of lessons were developed, increasing the adaptive capacity of the River System. Secondly, over three decades worth of Adaptive Management research and theorising indicates that it is a useful tool for managers in complex social ecological systems. Governments, agencies and policies continue to name Adaptive Management as both a principle and an operational directive, and operators manage adaptively, but if Adaptive Management continues to be perceived as a 'failure' even when it is not, support for the inclusion of Adaptive Management in natural resource programs will dwindle.

Australia's waterways need managers with a full set of management tools, including Adaptive Management, so it is important to seek and document the effective adaptive management that is occurring. This requires the will to do so, and the resources to ensure that evaluations of Adaptive Management are effective, timely and easily accessible.

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