Executive summary

Introduction

Seasonal climate forecasts are available in South Africa, yet they are of little value to the water management sector if they are not accessible and understood. Currently, these products, that address annual climate variability, do not yet appear to meet the needs and expectations of water resource managers. This project sought to identify processes and products that might facilitate increased uptake of all types of useful weather and climate information, and especially seasonal climate forecasts, among water resource managers.

Water resources are significantly impacted by climate variability particularly through the impact on run-off. There is also evidence that climate variability impacts on groundwater reserves much more dramatically than abstraction does (WRC, 2003). In a climate change context it will become more important to understand the impact of annual variability on water resources where climate change is expected to see changes in means and extremes (Midgley et al., 2005; Hewitson, 2007). However, the water management sector has not reached a stage of integrating information about changing intra-annual climate conditions in a systematic manner. Seasonal forecasts and climate change scenarios could help to manage the impacts of climate variability on water resources so that managers do not 'miss out' on realisable benefits purely because of lack of awareness of useful products or because the products have not been tailored to suit their needs.

Aim and objectives

The aim of the project was

- To improve the understanding of how water resource managers use weather and climate information and especially seasonal forecasts, and the potential for increasing uptake of forecasts.

The objectives of the project were:

- Assessment of current uptake of weather and climate information, including seasonal forecast information, among water resource managers
- Identification of the strengths and weaknesses in current climate prediction information from the water resource management perspective
- Assessment of the potential for improvement, or improved use, of climate prediction information through incorporation of newly-gained local and international knowledge of climate variability
- Demonstration of how climate prediction information has been used for water resource management and transfer of knowledge in this regard
- Identification of longer-term research and capacity-strengthening initiatives which would enable water resource managers to derive maximum benefit from climate modelling and prediction tools.

Methodology

The project comprised three stages, each of which required different methods. The three stages include:

- Stage 1: An inventory of available climate information in South Africa including short term weather and medium term climate information.
- Stage 2: Case studies of the City of Cape Town and Overstrand Municipality that explore how information about climate variability is currently utilised by water resource managers. The case studies comprised 3 stages:
    1. Interviews with key individuals,
    2. Workshops with a big group of stakeholders and
    3. Focus groups that explored how specific water resource strategies might be better able to use seasonal forecasts.
- Stage 3: Development of an online toolkit of climate information for water resource managers

Key findings

The key findings from the project focus on the question of whether water resource managers are aware of climate prediction information such as seasonal forecasts, if they are using them and if there is potential for them to be disseminated and used more effectively.

Finding 1: Current knowledge of the spectrum of weather and climate forecasts is limited

Water resources managers in general have little understanding of seasonal forecasts. Although many are aware of them, explanation and interpretation was needed to ensure the forecast figures and terminology were correctly understood. Most stakeholders were not aware of the amount of forecast information available. However, they were all eager to hear more information about the seasonal forecasts and how to interpret them.

Stakeholders in the City of Cape Town were more aware of seasonal forecasts than those in Overstrand municipality.

Finding 2: There is little evidence of integrated use of forecasts in the water sector

Emerging from the interviews and workshops, it became apparent that seasonal forecasts are of interest to a wide range of stakeholders in the water management sector. Yet, although the forecasts are factored into some decision-making frameworks, there is little evidence of the application on seasonal forecasts in actual decisions. The available forecasts seem to be accessed by some respondents; however, there is no evidence of systematic methods of including them in decisions.

One example of where seasonal forecasts were used was in the City of Cape Town for water restriction planning. The forecast is integrated into supply planning by forming part of a rolling probability study, which informs the city and officials of the Department of Water Affairs and Forestry (DWAF) about likelihoods of dam levels and usage demands. If the forecast suggested below normal rainfall when dam levels were already low, the City was more likely to consider restrictions.

The most active current use of forecasts seems to focus on short to medium term weather information, where dam withdrawal allocation decisions, irrigation scheduling and other medium term water management actions are determined by the weather prospects.

Finding 3: Utilisation of forecasts is hindered by lack of knowledge and limited interaction with climate scientists

The most common means of access to the seasonal forecasts has been the internet, and specifically SAWS (South African Weather Service) and CSAG (Climate Systems Analysis Group at the University of Cape Town) websites. Some have had access to Envirovision (Johan vd Berg) where agricultural forecasts are provided.

Most users were not aware of the amount of information available. The nature of accessing the information via the internet means that there is limited interaction with the producers of the climate information and so users cannot further their understanding of forecast products.

Finding 4: Tailored products are needed that enable seamless integration of short, medium and longer term forecast information in water resource planning

Water resource managers requested indicators relating to the accuracy of seasonal forecasts. They also suggested that more active dissemination, interpretation and liaison between forecasters and water managers would improve the use of the information. It was clear that there were definite opportunities that were not being utilised at the moment. Methods need to be developed that enable historical data and forecast data to be used in planning. It is these tailored products that might make it easier for water resource managers to integrate seasonal forecast information in their planning.

Conclusion

In this project the uptake and usefulness of forecasts by water resource managers has been improved through intensive stakeholder involvement and lessons regarding the availability, comprehension, and current and future usefulness have been learnt. The future success of forecast uptake and usefulness depends on these lessons being converted into more skilful, better disseminated and more aptly targeted forecasts. It is also necessary that more opportunities are provided for those with climate knowledge to interact with water resource managers. This is particularly important in the context of increased long-term climate variability. A product of the project, the climate information toolkit, can assist with increasing the exposure, accessibility and usefulness of forecast information.

It is hoped that this project and specifically the toolkit resource will supplement and enhance existing products available to water resource managers in South Africa.