

**THE POLITICS OF KNOWLEDGE:
CASE STUDY OF THE MANAGEMENT OF BEACH WATER
QUALITY IN DURBAN, SOUTH AFRICA**

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November 2015

Submitted in fulfilment of the academic requirements for the Master of Social Science degree
in the School of Built Environment and Development Studies,
University of KwaZulu-Natal, Durban.

ACKNOWLEDGEMENTS

The financial assistance of the National Research Foundation (NRF) towards this research is hereby acknowledged. Opinions expressed and conclusions arrived at are those of the author and are not necessarily attributable to the NRF.

I would like to extend thanks to my supervisor, Dianne Scott, for encouraging me ‘to take the escalator instead of the stairs’. I am grateful for the continuous academic (and life) advice and support given to me over the last seven years and for again walking me through the journey of another research project.

On this note, thanks must also be given to my co-supervisor (and boss for one year), Louis Celliers, for providing advice and guidance related to my research and for exposing me to the inner-workings of a research institute

I would like to thank all the interviewees who willingly gave of their time and experience. Their contributions informed my understanding of the complexities of water quality management in Durban and were instrumental in the development of the final product.

eThekwin Municipality must also be thanked for providing the necessary permissions for me to interview municipal employees and therefore for enabling the research.

Thanks must also be extended to the South African Weather Service (SAWS) for providing me with climatic and weather data for the study area.

On a personal note, thanks must go to my parents, Derek and Sharon, for their continued support, financial and otherwise, given to me over the course of my extended academic career. The innumerable hours spent editing chapters, assisting with illustration advice, and providing motivation to finish are invaluable and cannot be earned back. Thank you for willingly giving of your time and love.

Most importantly, to my loving wife, Leanne, thank you for making the big sacrifices necessary for me to undertake this degree and for slaving away to support us financially. The unending

financial and emotional support you have given me over the last two years has freed me up to focus on this thesis. Without this support I do not think I would have made it to the finish line.

PREFACE

The experimental work presented in this study was carried out in the School of Built Environment and Development Studies, University of KwaZulu-Natal from July 2013 to November 2015 under the supervision of Professor Dianne Scott and Dr. Louis Celliers.

All work presented herein represents the author's original work and has not otherwise been submitted in any form for any degree or diploma to any tertiary institution. Where use has been made of the work of others it is duly acknowledged in the text.

Signature

As the candidate's supervisor I have/have not approved this thesis for submission.

Date:

Name:

Signed:

LIST OF ACRONYMS

ANC	African National Congress
AFRI	Acute Febrile Respiratory Illness
BFP	Blue Flag Programme
CEC	Council of the European Community
CFU	Colony Forming Units (of bacteria)
CKM	Co-Production of Knowledge Model
CMP	Coastal Management Programme
CSCM	eThekwin Municipality Coastal Engineering, Storm Water and Catchment Management Department
CSIR	Council for Scientific and Industrial Research
CZM	Coastal Zone Management
DA	Democratic Alliance (South African political party)
DEA	National Department of Environmental Affairs
DEAT	National Department of Environmental Affairs and Tourism
DEDT	KwaZulu-Natal Department of Economic Development and Tourism
DWAF	National Department of Water Affairs and Forestry
EDTEA	KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs
EEA	European Environment Agency
EU	European Union
EXCO	Executive Committee
FEDHASA	Federated Hospitality Association of South Africa
FEE	Foundation for Environmental Education
FSC	Forestry Stewardship Council
GDP	Gross Domestic Product
GI	Gastrointestinal Illness
ICM	Integrated Coastal Management
ICM Act	Integrated Coastal Management Act
IDP	Integrated Development Plan
ISO	The International Organisation for Standardisation
KZN	KwaZulu-Natal
LED	Local Economic Development

LOAEL	Lowest-observed-adverse-effect-level
MCMP	Municipal Coastal Management Plan
MEC	Member of the Executive Council
MF	Minority Front
NCMP	National Coastal Management Plan
NEMA	National Environmental Management Act
NGO	Non-Governmental Organisation
NOAEL	No-observed-adverse-effect-level
NRF	National Research Foundation
PDM	Public Deficit Model
PCMP	Provincial Coastal Management Plan
PEM	Public Education Model
RSA	Republic of South Africa
SA	South Africa
SABS	South African Bureau of Standards
SALGA	South African Local Government Association
SANAS	South African National Accreditation System
SANS	South African National Standards
SANCOR	South African Network for Coastal and Oceanographic Research
SSA	Statistics South Africa
SAWS	South African Weather Service
UN	United Nations
WESSA	Wildlife and Environmental Society of South Africa
WHO	World Health Organisation
WRC	Water Research Commission

ABSTRACT

Whatmore (2009: 588) suggests that knowledge controversies surface when the “rationales of environmental science and policy fail to convince those affected by what is at issue” and force a variety of actors to be included in the policy processes around these issues. These situations are increasingly commonplace in the socio-economic context of the ‘network society’ which requires a form of governance able to accept and process a diverse array of knowledge inputs to arrive at robust policies and decisions. Increasing emphasis is placed on the demand for inclusion of varied knowledge claims, policy-making, and knowledge production processes. In Durban, a knowledge controversy surfaced when the public questioned eThekweni Municipality’s reasoning, position, and knowledge regarding the unsuitability of the Blue Flag Programme for its ‘Golden Mile’ beaches. This thesis aims to provide a social science understanding of a marine science issue: the faecal contamination of urban coastal waters, by using the case of Durban’s involvement with the Blue Flag Programme between 2002 and 2014. A qualitative methodology, discourse analysis, is utilised as a tool for exploring meaning bound up in language. It is proposed that numerous environmental discourses were used by a variety of Durban residents to understand and argue about eThekweni Municipality’s decision-making around its beach management policies. Furthermore, evidence collected in the research illustrates that the absence of a formal public engagement process created an environment in which the media, primarily the popular press, was the primary source of information for the public. This gave rise to a situation which resulted in an ever-evolving political debate in which public opinion was galvanised against the Municipal authority’s decision-making through informal establishment of a discourse coalition comprising varied actors from Durban’s civil and professional societies. It also created an enabling environment for co-production of knowledge although this ideal was not fully realised as the Municipal decision to re-join the Blue Flag Programme sated widespread public antipathy for Municipal decision-makers by effectively resolving the knowledge controversy.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The coastal zone is the zone found at the interface of land and sea and is among "the most favoured locations to either live permanently, for leisure, recreational activities, or tourism" (Martínez *et al.*, 2007: 255). Being a zone of high biophysical complexity and a rich source of socio-economic opportunities, especially those arising from tourism, places the coastal zone under significant pressure. The global tourism industry is one of the fastest growing industries, regarded by some authors as the most appropriate industry for generating local economic development (LED). Tourism has become an integral feature of economic development planning and policy-making in both the developed and developing world (Kaplan, 2004; Maharaj *et al.*, 2006; Nel *et al.*, 2003). South Africa has taken cognisance of this trend and have actively engaged in marketing the coastal zones and beaches of the country. Durban¹ is currently marketed as South Africa's playground with specific focus assigned to those beaches situated in what is colloquially known as the 'Golden Mile' (Durban Tourism, 2013). The biophysical complexity of Durban's 'Golden Mile', coupled with existing and potential socio-economic opportunities creates an imperative for good governance of the resource in order to ensure that the most economic, ecological, and social benefit is realised.

There is growing recognition among scientists, experts, and lay persons that the world is becoming increasingly complex and interconnected. It is suggested by some academics and researchers that this increasing complexity often results in instances in which orthodox problem solvers, namely, the scientists, possess insufficient knowledge to provide robust solutions and technical advice to solve problems; these solutions are frequently rejected by the public (Callon, 1999; Lane *et al.*, 2010; Whatmore, 2009). Public rejection arises around disputes over the efficacy or accuracy of expert knowledge claims. Whatmore (2009: 588) suggests that these instances of rejection represent "unsettled public trust in scientific expertise and its relationship to public policy making" and terms such instances, 'knowledge controversies'.

¹ The name Durban is historically and currently used to refer to the city. However, since 2001, the urban area of Durban and its peri-urban fringe have been demarcated as the eThekweni Municipality for administrative purposes. The name Durban is used when referring specifically to features of the city, while eThekweni and Municipality (capitalised) are used interchangeably when referring to the administrative area in which policy decisions are made.

In the past decade, the ‘Golden Mile’ beaches have been subjected to two distinct management approaches by eThekweni Municipality authorities. The decision to change from the Blue Flag Programme (BFP) approach to its own in-house, Municipal Programme of beach management in 2008 has attracted criticism and controversy. In light of this problem, the main research question is: what is the basis for the intense politicisation and contestation of the eThekweni Municipality’s changing stance towards managing the water quality of its ‘Golden Mile’ beaches?

1.2 Rationale

A number of factors were considered when deciding to undertake the research project. Central to the research into beach management programmes is the problem of potential pathogenic contamination of urban recreational beaches. The primary motivation for the study is to provide an understanding of the impact of environmental politics on the implementation of a particular aspect of Integrated Coastal Management (ICM), namely, beach water quality management. In so doing, recommendations for improving the governance of Durban’s ‘Golden Mile’, especially from a water quality perspective, are made.

The central beaches of Durban are located on what is commonly referred to as the ‘Golden Mile’. This name is apt since these beaches add value to the city, and the province, as major tourism attractions (Durban Tourism, 2013; Maharaj *et al.*, 2006). In 2001, South Beach, on the ‘Golden Mile’ was awarded Blue Flag accreditation (Bisetty, 08/07/2004; Fourie, 04/07/2012). By 2006, in addition to South beach, a further six eThekweni beaches, three of which were located on the ‘Golden Mile’, were awarded Blue Flag status and accredited by the BFP. These were: Addington Beach; Bay of Plenty Beach; and North Beach (Nzama, 28/10/2005). Accreditation by the BFP indicated that these beaches complied with 33 criteria, spread over four categories, namely, environmental education and information, water quality, environmental management, and safety and services (The Foundation for Environmental Education, 2014). In 2008, after exceeding the microbiological standards for water quality set by the BFP (FEE, 2014), eThekweni Municipality, responsible for the management of the city, withdrew from the programme, refuting its relevance for Durban and choose instead to use their own in-house system and standards to monitor beach water quality (De Boer, 14/03/08; Fourie, 04/07/2012; Ryan, 04/05/2008). According to some, these self-designed standards did

not conform to the World Health Organisation (WHO) standards, nor to those of the Blue Flag (Carnie, 16/03/2008; FEE, 2014). This refutation of the Blue Flag standards and the loss of Blue Flag status at all of eThekwin's beaches was criticised from many quarters of Durban's civil and professional bodies. Such criticism was highly publicised in the popular press between 2006 and 2010 (Fourie, 04/07/2012; Jones, 12/07/2008; Pullan, 29/08/2012; Savides, 01/11/2009).

As a voluntary eco-label, a major benefit of the Blue Flag is its ability to serve as a marketing tool, since it is suggested that tourists, especially those from Europe, can plan beach holidays to accredited sites (Buckley, 2002; Gallastegui, 2002; Teisl *et al.*, 2002). The loss of Blue Flag status therefore has potential implications for the local tourism industry. This economic value of the central coastal zone provides an economic motivation for effectively managing the water quality of the 'Golden Mile' beaches.

This study provides a social science perspective of marine science which is currently lacking in the literature (Scott, 2013; Snowman, *et al.*, 2013). The feasibility of the study, accessibility to the study area, and information available were also factors conducive to conducting the study. Poor water quality poses a serious health risk to users. As a Durban resident and surfer, the researcher has on several occasions, fallen victim to gastrointestinal illness after being in the water for extended periods. This provides a personal motivation for conducting the study.

1.3 Aim and objectives

In light of the research problem, namely, the political contestation of the management of Durban's 'Golden Mile' beaches, the aim of the research is to understand the politicisation and contestation in relation to eThekwin Municipality's changing policies of beach water quality monitoring and management and the underlying knowledge upon which these policies are based, in order to make recommendations for improving governance of eThekwin's 'Golden Mile' beaches.

In order to achieve the aim a number of objectives have been set. These objectives will aid in research design and will guide the research:

1. To explore understandings of water quality held by a wide range of knowledge holders;

2. To explore the knowledge that forms the basis of the two different water quality management approaches employed by the Municipality and understand how this knowledge is used;
3. To explore the politics in relation to the adoption of these different management approaches within the Municipality;
4. To assess which of Callon's (1999) three models of knowledge production is most applicable to each of the water quality management approaches adopted by eThekwin;

1.4 Structure of thesis

This chapter provides an introduction to the research and outlines motivations for conducting the study. Additionally, it presents the aim and objectives of the study. Finally, a brief outline is provided of the structure of the thesis by way of a chapter summary.

Chapter Two reviews the relevant literature and establishes the theoretical framework for the study. It is split into five sections. The research takes place within the hermeneutic constructivist paradigm in which meaning is assumed to be a social construct that can only be accessed and understood through qualitative enquiry and all five main bodies of literature are reviewed through the lens of the theoretical framework.

The first section focuses on the socio-economic shifts characteristic of Castells' (2005) 'network society'. The 'network society' is characterised by increasing complexity and interconnectedness. Governance within this socio-economic setting occurs through networks comprising multiple, diverse actors. In this study, the actors are knowledge holders and the network is viewed as an informal arrangement of knowledge holders from Durban's professional and civil society.

Building on this, the second part of this chapter explores the role and value of knowledge within the 'network society'. The commodification of knowledge characteristic of an increasingly interconnected and complex societal context has resulted in a shift in the thinking around knowledge production and decision-making processes (Callon, 1999; Castells, 2005; Gibbons *et al.*, 1994, Lane *et al.*, 2010; Whatmore, 2009). Owing to the complexity of the biophysical environment, solutions to environmental problems within a governance framework are generally challenging and necessitate inclusion of multiple knowledge holders, especially those

previously disregarded on the basis of assumed inferiority of their knowledge: non-scientific knowledge holders.

The third part of this chapter reviews literature that critiques the orthodox relationship between science and society. An orthodox reliance on scientific knowledge to provide solutions to societal problems is termed mode 1 knowledge by some authors (Gibbons *et al.*, 1994). Callon (1999) proposes three models of knowledge production, two of which accord with the conceptualisation of mode 1, namely, public education model (PEM) and the public deficit model (PDM). This mode of knowledge production provides evidence for decision-makers. It is argued that a new way of conceptualising knowledge production processes is required in response to the increasing complexity of the ‘network’ and ‘knowledge’ societies. This literature provides further motivation for including multiple knowledge types in deliberative processes, through what is conceptualised as mode 2 knowledge production (Gibbons *et al.*, 1994). Callon (1999) suggests that mode 2 knowledge is essentially co-produced within what he terms a co-production of knowledge model (CKM).

Progressing from this critique of knowledge production, a typology of knowledge is presented in the fourth part of this chapter. The typology presents the following knowledge types because it is argued that the research encounters all three knowledge types: tacit knowledge; embedded knowledge (political and professional); and codified knowledge (Gibbons *et al.*, 1994). This typology assumes a continuum of knowledge from experiential at one extreme to scientific knowledge at the other extreme. It is argued that all three knowledge types should be treated with equal consideration in decision- and policy-making processes.

Finally, the chapter concludes with a review of discursive environmental knowledge. It is suggested that transmission of knowledge occurs discursively and therefore discourse analysis is an appropriate analytical tool for exploring meaning which is bound up in language. The BFP, marketed as an ecolabel² by the Foundation for Environmental Change (FEE) is conceptualised as environmental discourse that constructs an environmental story-line about a specific model of beach management.

² An ecolabel is considered to be any form of label that seeks to inform potential consumers about the effects on the environment of the various lifecycle phases of a product or service (Gallastegui, 2002).

Chapter Three sets the scene for the research by providing a detailed context to the study area. This forms the contextual framework of the study and describes Durban's 'Golden Mile' beaches. Initially the geophysical context is presented before exploring the links between climate, tourism, and the economy of Durban. An examination of coastal governance and the Integrated Coastal Management Act, No. 24 of 2008 (ICM Act) follows, before presenting an analysis of Durban's involvement with the BFP, graphically summarised through use of a timeline. Finally, the regulatory and scientific context of water quality monitoring is discussed.

In Chapter Four, the methodology employed in the research is described. All methodologies utilised are framed within the social constructivist philosophical approach because the research is concerned with interpreting and understanding multiple layers of meaning bound up within environmental discourses present in the debate around Durban's future involvement with the BFP. A purposive sampling technique enabled the researcher to select knowledge holders with an assumed competence of the 'Golden Mile' beaches. Semi-structured interviews were conducted with all identified knowledge holders as a means of collecting primary data; documentary data in the form of newspaper articles is used to supplement primary interview data. A thematic discourse analysis was used to explore and interpret the data and identify the multiple environmental discourses used by Durban residents to understand Durban's BFP involvement.

Chapter Five and Six present the findings of study and consist of an analysis of data collected from interviews and newspaper articles, with emphasis on achieving the objectives of the study. Chapter Five focuses on an account of water quality, as understood by a broad spectrum of knowledge holders, before exploring the perceived knowledge base for each of the two beach management approaches adopted in eThekweni over the past 12 years, namely the BFP and the Municipal Programme. Chapter Six employs a discourse analysis to highlight the environmental discourses present in the political debate around the BFP in Durban, enabling identification of four distinct phases of engagement in the debate about Durban and eThekweni's future involvement with the BFP. Additionally, discourse analysis enables the engagement between the public, the BFP, and eThekweni to be better understood and categorised according to Callon's (1999) knowledge production models. Timelines are employed as a means of graphically illustrating the analysis.

Finally, Chapter Seven provides a conclusion to the study and presents recommendations for future governance of Durban's 'Golden Mile' beaches by exploring some lessons that can be drawn from the study.

CHAPTER 2

THEORETICAL FRAMEWORK

2.1 Introduction

This thesis aims to understand the environmental politics within the eThekweni Municipality that have surrounded the Blue Flag Programme (BFP) from 2002 to 2014. The project focuses on the subjective understanding of water quality and what it means to the users, residents, managers and scientists of Durban. Additionally, it seeks to understand the environmental politics and political contestation that has been part of the policy-making process within Durban's local government. The primary objective of the research is to understand the eThekweni Municipality's changing policies towards beach water quality management. This chapter provides a review of the relevant literature and in so doing will develop a theoretical framework for the research. This will provide the conceptual and analytical tools to answer the research questions.

Knowledge production processes and contestation lie at the heart of this study and it can therefore be said that this body of social theory forms the meta-theory within which the research is framed. An interpretive, qualitative approach to knowledge has been employed since the research is concerned both with exploring understandings of water quality as well as understanding the political contestations surrounding the BFP within the Durban local government over the period 2002 to 2014. In providing such an understanding meaning is assumed to be bound up in social context and thus can only be understood within a qualitative and hermeneutic framework (Griggs, 2000; Kitchin & Tate, 2000; Mottier, 2005).

Section 2.2 reviews literature on the socio-economic shifts that have taken place in the past three decades providing the impetus for a new form of governing that is more inclusive of multiple actors and knowledge types (Castells, 2000; Hajer & Wagenaar, 2003). Within the 'network society' knowledge is a commodity to be traded like any other and this has prompted a number of authors to begin theorising about the processes that produce and disseminate knowledge, with emphasis placed on who participates and what knowledge types dominate these processes (Castells, 2000; Funtowicz & Ravetz, 2003; Gibbons *et al.*, 1994; Hajer & Wagenaar, 2003; van Ewijk & Baud, 2009). Some suggest that the 'network society' is also the 'knowledge society' (Bruckmeier & Tovey, 2008; Castells, 2005; Tovey, 2008). This

theory grounds the research within a post-positivist paradigm and provides the foundation for much of the literature that has been reviewed.

Section 2.3 focuses on the ‘knowledge society’. It deals exclusively with knowledge production and its contestation in governance and explores the processes by which knowledge is created, who is involved in these processes, what knowledge is deemed valuable, and what knowledge is discarded. The literature further highlights the paradigmatic shift in thinking about these processes towards more deliberative forms of decision-making, especially within the environmental field where knowledge controversies often arise (Callon, 1999; Castells, 2000; Gibbons *et al.*, 1994; Lane *et al.*, 2010; Whatmore, 2009).

Building on the theories of the ‘network society’ and the ‘knowledge society’, section 2.4 explores the relationship between science and society. The literature in this section deals with the orthodox relationship between scientific knowledge and the public and provides an understanding of knowledge production processes. Various authors speak of the reliance on science as a basis for decision- and policy-making, or evidence-based decision-making (Callon, 1999; Castells, 2005; Gibbons, *et al.*, 1994; Lane *et al.*, 2010; Nowotny *et al.*, 2003; Whatmore, 2009). Additionally, the literature shows the shift away from decision-making processes dominated by scientific or expert knowledge, termed mode 1 knowledge, and towards more inclusive processes that seek to bring lay persons into these circles, termed mode 2 knowledge (Callon, 1999; Lane *et al.*, 2010; Whatmore, 2009). It is proposed that this shift has been driven by the increasing complexity and interconnectedness characterising the ‘network society’, and in this case in the realm of the environment where environmental controversies are increasingly evident.

A typology of knowledge is presented in section 2.5 and this highlights the three knowledge claims present in the reviewed literature: tacit; embedded; and codified (Callon, 1999; Gibbons *et al.*, 1994; van Ewijk & Baud, 2009). Traditionally, knowledge production processes have prioritised codified knowledge (and embedded to an extent) over tacit knowledge. The political shifts from government to governance in society explored in the preceding sections, point towards a need to be more inclusive of these previously marginalised knowledge types.

Finally, section 2.6 presents an understanding of discursive forms of knowledge. The common way of expressing, transmitting or exchanging knowledge is through language, in either oral

or written form. Discourses are social constructions that allow users to interpret information and define the realm of possibility (Dryzek, 2005). They are often contested and groups of actors form discourse coalitions to jointly promote particular discourses. This section examines environmental discourses, environmental controversies, and then ecolabelling as a form of environmental discourse.

2.2 The network society and governance

The literature points to a shift in the manner in which government functions within the globally transforming socio-economic context. This socio-economic transformation has brought about new ways of governing characterised by an increasing emphasis on the inclusion of multiple actors aside from the state. The section that follows explores this transition from government to governance within what Castells (2005) calls the ‘network society’. This is particularly relevant to this research as it is concerned with the way in which knowledge is produced for coastal governance and management.

The shift from government to governance has been underway for approximately four decades (Castells, 2005; Hajer & Wagenaar, 2003). Castells (2000:1) suggests that towards the end of the twentieth century a “technological revolution, centred around information technologies, began to reshape, at accelerated pace, the material basis of society”. This reshaping of society and the progression towards new ways of governing is inextricably related to global economic trends in which “economies throughout the world have become globally interdependent, introducing a new form of relationship between economy, state, and society” (Castells, 2000: 1). Within this socio-economic context, new and different commodities are created and traded, dominated by the industries of technological innovation and information technologies, placing increasing emphasis on the concept of intellectual property and intellectual property rights (Nowotny *et al.*, 2003). The emergence of a new social context has resulted in wholesale re-engineering of the political, social, and economic landscape which has necessitated a new conceptualisation of government, as well as motivating for new ways of thinking about knowledge.

This new conceptualisation of the way in which governments function through governance, involves the inclusion of multiple actors in decision-making circles, and rests on the premise of participatory democracy in which laypersons have the potential to contribute to, and in some

instances direct, policy-making decisions (Hajer & Wagenaar, 2003). This is due, in part, to the receding role of the neo-liberal state in providing essential goods and services required for the socio-economic functioning of society, coupled with a lack of certainty over the state's role and its political functions (Castells, 2000). A common conceptualisation of this new form of governance is that of a network in which numerous actors create connections around multiple nodes, political, cultural, and institutional. Such conceptualisation has found its way into mainstream literature leading a number of authors to posit that this new era of governance functions in what is known as the 'network society' (Castells, 2000; Hajer & Wagenaar, 2003; Innes & Booher, 2003). The shift from government to governance is linked with a shift in the global economy where knowledge is deemed a commodity to be traded like all other goods and services.

Within the 'network society', three broad characteristics emerge that provide insight into the socio-economic restructuring of society. The 'network society' is global since this is the scale at which "production, consumption and circulation" of commodities takes place (Castells, 2000: 77). Secondly, it is said to be networked because the production, consumption and circulation of commodities takes place through a global network of interconnections (Castells, 2000). Finally, it is informational because knowledge and information technologies and their outputs are the main commodities traded in the 'network society'. Indeed, Castells (2000: 77) suggests that "productivity and competitiveness units or agents ... fundamentally depend upon their capacity to generate, process, and apply efficiently, knowledge based information". This third characteristic of the 'network society' has led some authors (Bruckmeier & Tovey, 2008; Castells, 2005; Tovey, 2008) to theorise about the 'knowledge society' and knowledge production.

A number of authors have suggested that the transition from government to governance marks a sea change in the manner in which science is perceived by lay persons (Castells, 2000; Funtowicz & Ravetz, 2003; Hajer & Wagenaar, 2003; Gibbons *et al.*, 1994; van Ewijk & Baud, 2009). This in turn has implications, not only for public engagement with science and policy, but also for the legitimacy and credibility ascribed to scientific knowledge by laypersons (Castells, 2000; Gibbons *et al.*, 1994; van Ewijk & Baud, 2009; Whatmore, 2009). The relative value assigned to the knowledge produced by both science and the state is questioned; the orthodox relationship between science and policy is critiqued; and confidence is waning in the

ability of the state, as the chief employer of science as the basis for policy-making (evidence-based decision-making), to provide effective guidance and resources.

2.3 The knowledge society

The past two decades have witnessed changing trends in the manner in which knowledge is generated, produced, and taken up into policy (Callon, 1999; Castells, 2000; Gibbons *et al.*, 1994). These changing trends, among others, have given rise to the concept of the ‘knowledge society’. Central to this concept is recognition of the crucial socio-economic function fulfilled by knowledge and information (Bruckmeier & Tovey, 2008; Castells, 2005; Tovey, 2008). Knowledge is regarded as a commodity, “produced, accumulated, and traded like other goods and services” (Callon, 1999: 185) and this has altered and transformed the nature of the research process. According to Nowotny *et al.* (2003: 181) there are three broad trends considered to be important in this shift: “the ‘steering’ of research priorities ... the commercialization of research, and ... the accountability of science”. These trends have implications for the credibility or legitimacy of the objectivity of scientific research and the knowledge it produces.

A number of authors observe that, in recent decades, the processes of knowledge production and exchange have been subject to substantial critique and reflection. The outcome of such research is a paradigmatic shift in the thinking around these systems of knowledge production (Callon, 1999; Castells, 2000; Gibbons *et al.*, 1994; Lane *et al.*, 2010; Whatmore, 2009). At the crux of this change is the applied nature of knowledge, wherein problem solving “is organised around a particular application” (Gibbons, *et al.*, 1994: 3). It is argued that this context of application is a consequence of the growing realisation that the increasing complexity of society and the problems created, particularly environmental, necessitate new ways of thinking about potential solutions that alter the relationship between science and policy (Callon, 1999; Lane *et al.*, 2010; Whatmore, 2009).

In order to provide adequate solutions to increasingly complex problems, knowledge domains other than science are being called to provide input into knowledge production, and to fill the gaps that science alone is unable to fill. In this new paradigm, the processes by which knowledge is produced are deemed more inclusive, with participation by varied knowledge holders or stakeholders a necessity (Callon, 1999; Gibbons *et al.*, 1994; Nowotny *et al.*, 2003). This challenges the current orthodoxy in which scientific and expert knowledge devalues or

suppresses all other knowledge claims (Bruckmeier & Tovey, 2008). Within the orthodox paradigm, techno-scientific knowledge dominates and is regarded as the only credible and legitimate knowledge claim, creating a binary division between knowledge produced by science and all other types of knowledge, especially locally specific lay knowledge. Gibbons *et al.* (1994: 2) suggest that the elevated legitimacy of scientific knowledge within the orthodox model of knowledge production is so socially ingrained that “all other [knowledge] claims will be judged with reference to it”.

2.4 Science and society

The literature on the relationship between science, policy and the public, sees increasing attention being given to research focussed on the understanding of processes whereby knowledge is formed. Indeed, several authors have already begun the task of analysing processes by which knowledge is produced, exchanged, and contested, while theorising about the ways in which this process is changing due to socio-economic restructuring prevalent in the ‘network and knowledge society’ (Callon, 1999; Castells, 2005; Gibbons, *et al.*, 1994; Lane *et al.*, 2010; Nowotny, *et al.*, 2003; Whatmore, 2009). This literature points to the conventional relationship between science and the public and the ways in which scientific knowledge is taken up into policy. An outcome of the conventional reliance on science is evidence-based decision-making, where science provides the basis for decision and policy-making (Lane *et al.*, 2010). The following sections examine the shift away from evidence-based decision-making towards new ways of producing knowledge in the ‘network and knowledge society’.

2.4.1 Evidence-based decision-making

The orthodox model of policy- and decision-making rests on the implicit assumption that lay knowledge is subjective, non-generalisable, and valueless, versus the superiority of scientific knowledge which is assumed to be objective, universal, and valuable (Lane *et al.*, 2010). These implicit assumptions are often unchallenged and, within certain professions so entrenched, that relying on other forms of knowledge to make to decisions is tantamount to malpractice. The orthodoxy creates, according to Owens (2005: 288), “an unproblematic, linear relationship in which the output from one process, the production of knowledge by disinterested experts, becomes the raw material for another, the making of policies and decisions by elected representatives and their officials”.

A reliance on expert or scientific knowledge for policy-making, especially within the environmental sphere, has resulted in development of norms, standards and regulations, based on objective, rational measurement of natural phenomena. This is founded on the scientific method's emphasis on rigour, replication, and objectivity. Expert scientific knowledge has, and continues to, dominate policy-making in the context of coastal zone management (Scott, 2013; Snowman *et al.*, 2013). A plethora of norms and standards, and the requisite measurements and measurement techniques, have been developed as criteria to judge the quality of knowledge for use within marine and coastal environments, such as for example, those associated with marine water quality testing. In many instances links exist between the standards of one scientific discipline and those of another. For example, epidemiological knowledge, which is generated by scientific method, has determined levels of microbiological pathogens in marine recreational waters in order to develop standards to prevent the transmission of illness in humans (Mardon & Stretch, 2004). The development of standards for water quality has enabled local governments around the world to develop water quality monitoring programmes that place emphasis on the measurement of pathogenic pollutants present in tested water (Mardon & Stretch, 2004).

Environmental standards

Environmental standards and the measurement of associated criteria and indicators are critical tools for evaluating environmental impact or change. They enable environmental managers and scientists to ascertain impacts on the environment and to take action to limit or reduce harmful or negative impacts, especially those with anthropogenic drivers. The Royal Commission on Environmental Pollution (1998: 3) provides a detailed definition of environmental standards, which, in their view, "may cover modifications to the environment, or the repercussions of such modifications, or activities or objects that have the capacity to bring about such modifications". In the setting of standards, Power (2014: 114) posits that,

“... science plays a number of different roles: as the foundational framework for standards ... ; as a form of testing and monitoring practice, such as for water toxicity; and simply as a general cultural resource ...”

According to the Royal Commission on Environmental Pollution (1998: 4), environmental standards can be split into two categories: those dealing with “the pathways which substances

follow until they meet or enter an entity that is susceptible to damage” and those that focus on environmental modification. The BFP could be classified as an environmental standard concerned with environmental modification and management. Embedded within this programme are standards aimed at setting thresholds for human exposure to microbiological pathogens. Standards are set on the premise that one can only manage what can be measured. In the highly complex coastal zone, an ability to ascertain environmental change is critical for managers and civil society alike, especially in the face of the potential impacts associated with climate change in the coastal and marine systems. These include impacts such as, rising sea levels, increased storm frequency and associated flooding on the ‘Golden Mile’, and damage to coastal tourism and economic infrastructure. Setting thresholds or standards aimed at limiting the impacts of climate change on the coast line, enables managers to be aware of the risks and to establish the necessary risk and disaster management plans to mitigate these risks.

2.4.2 Shift from mode 1 knowledge to mode 2 knowledge

As a result of the socio-economic restructuring present in the ‘network society’, there has been a shift in the processes by which knowledge is produced and exchanged. The reliance on expert, scientific knowledge for policy-making was prevalent in the conventional, centralised model of government. This model of knowledge production has been termed mode 1 knowledge. Under the new socio-economic paradigm and governance model, significant attention has been given to an alternative process of knowledge production and exchange, one that is less centralised, more context specific and more inclusive of stakeholders other than scientific experts. This has been termed mode 2 knowledge (Callon, 1999; Gibbons, *et al.*, 1994; Lane *et al.*, 2010; Nowotny *et al.*, 2003; Whatmore, 2009). The shift from mode 1 knowledge production to mode 2 knowledge production will be explored below.

The orthodox relationship between scientific knowledge and policy has relied largely on mode 1 knowledge. Numerous authors have noted the shift between this orthodox mode of knowledge production and a new way of producing knowledge, i.e. mode 2 knowledge (Callon, 1999; Gibbons *et al.*, 1994; Lane *et al.*, 2010; Nowotny *et al.*, 2003; Whatmore, 2009). These two models of knowledge production contrast starkly with one another. Mode 1 knowledge is characterised as disciplinary, homogenous, hierarchical, and generalisable, while mode 2 knowledge is characterised as transdisciplinary, heterogeneous, heterarchical, transient and context specific (Gibbons *et al.*, 1994). Whatmore (2009) suggests further that mode 1

knowledge is codified, certified and scientific, contrasting with mode 2 knowledge which is democratic, informed by non-specialists and negotiated.

A defining feature of the ‘network society’ is the shift from mode 1 knowledge production to mode 2 knowledge production that is linked to socio-economic restructuring (Castells, 2005). The shift demands a more inclusive process of knowledge construction that promotes collaboration and reflection among research teams and therefore requires input from multiple actors aside from the state. The literature suggests numerous characteristics of such inclusive processes and Callon (1999) provides a synopsis of three models that describe the progression of knowledge production and exchange processes towards more inclusivity.

For Callon (1999) there are three models or modes by which knowledge is produced and taken up by the public. He proposes that the relationship between scientific knowledge production and the public can be understood via the following models:

1. The Public Education Model (PEM);
2. The Public Debate Model (PDM);
3. The Co-Production of Knowledge Model (CKM)

Different assumptions about the relative importance and inclusion of lay knowledge are inherent in each of these models which focus on the relationship between science and society. The Public Education Model (PEM) premises that lay persons hold inferior knowledge to that of scientists and experts and therefore cannot be relied on to know what is best for them (Callon, 1999). The public is therefore reliant on education and awareness, delivered by experts who hold objective, generalisable and universal knowledge (Lane *et al.*, 2010). It assumes that only education can improve the knowledge held by lay persons and enable them to have effective voices in decision and policy-making processes. The orthodox relationship between science and the public is an implicit condition of this model, succinctly summed up in the following assertion by Callon (1999: 82), “not only must scientists teach the public everything, they also have nothing to learn from it”. This model relies on a relationship of trust between scientists and lay persons.

The Public Debate Model (PDM) can be said to be a progression towards a more inclusive relationship between science and society. In this model, scientific and expert knowledge; objective, universal and generalisable is dominant and still stands in contrast to the lay

knowledge of the public, which cannot be relied upon to make decisions (Callon, 1999). This model is more inclusive since it rests on the premise of including numerous and varied public actors, invited to comment on the scientific knowledge that is to be used for policy- and decision-making. However, the public are invited simply to comment on and not debate the scientific knowledge in relation to their locally relevant and contextually specific knowledge (Callon, 1999). This can be understood as an acknowledgement that science is incomplete and requires input from a public who may be affected by a policy solution and that there needs to be consultation of people to create a more democratic process of decision-making. There is therefore a progression towards accepting the inherent value of lay knowledge by science. However, it could equally be suggested that the consultation of the public in these decision and policy-making arenas and processes is politically expedient and serves to limit instances of rejection of policies by the public (Lane *et al.*, 2010). Representivity becomes a crucial tool for attaining legitimacy within this model (Callon, 1999). This model explains the ‘stakeholder processes’ that are mandated by government to include interested and affected parties in policy-making processes and represents the current ‘stakeholder consultation’ model currently prevalent in South Africa.

The Co-Production of Knowledge Model (CKM) accords with the concept of mode 2 knowledge in that its explicit premise is the valuing and recognition of lay knowledge, and the promotion of truly collaborative dialogue in decision and policy-making processes, where all knowledge claims are considered of equal value (Callon, 1999; Lane *et al.*, 2010). Thus, all knowledge is regarded as equally credible and legitimate. It proposes that it is necessary to arrive at robust and mutually negotiated outcomes in policy-making processes (Callon, 1999). Legitimacy within this model “relies entirely on the ability of the concerned groups to gain recognition for their actions” (Callon, 1999: 92).

Hajer & Wagenaar (2003) term this ‘deliberative policy-making’. Under the rubric of deliberative policy-making, knowledge is negotiated by all interested and affected parties and feeds into policy-making (Hajer & Wagenaar, 2003; Innes & Booher, 2003). All knowledge claims are deemed equal.

2.4.3 Environmental controversies

The literature proposes that environmental controversies arise when scientific explanations of environmental catastrophes or issues are rejected by the public (Dryzek, 2005; Eden, 1998; Lane *et al.*, 2010; Whatmore, 2009). This is becoming increasingly common due to the unintended consequences of human technological actions, which have a scientific foundation. Environmental controversies can be described as instances in which human action in both the ‘knowledge and network societies’ has impacted the environment to such a degree as to cause environmental catastrophe and people to lose trust in science.

The notion of an environmental controversy is closely related to Beck’s *Risk Society* (1992) where he theorises the risks associated with modernity such as “leakages from factories, nuclear power generation and the ingestion of pesticides” (Eden, 1998: 425). Related to Castells’ (2005) theory on the socio-economic structuring of the ‘network society’, environmental controversies are allied to the amplification of risk and uncertainty in a global and interconnected world, where seemingly benign actions can have unintended consequences. The response of science in attempting to address these unintended consequences often exacerbates the issue at hand or creates additional risk and controversy and results in public rejection of scientific solutions. Indeed, according to Sarewitz (2004: 386),

“In areas as diverse as climate change, nuclear waste disposal, endangered species and biodiversity, forest management, air and water pollution, and agricultural biotechnology, the growth of considerable bodies of scientific knowledge, created especially to resolve political dispute and enable effective decision making, has often been accompanied instead by growing political controversy and gridlock”.

Whatmore (2009: 588) conceptualises environmental controversies as “moments of ontological disturbance in which the things on which we rely as unexamined parts of the material fabric of our everyday lives become molten and make their agential force felt”. These moments often play out in real life environmental disasters or calamities where they are brought to the forefront of people’s experience with the environmental problem at hand. The central problem dealt with in this research serves as a good example of an environmental knowledge controversy: public rejection of the science behind the measures and standards employed by eThekweni Municipality in their self-designed beach water quality policy.

Environmental controversies fall within the realm of environmental politics since they give rise to an intense contestation between a range of actors, each framing their argument within a particular environmental discourse. Hajer (2005) refers here to ‘argumentative discourses’, each of which argues for a different understanding of an environmental controversy and view of the environmental future. Not all discourses have equal power and in the contestation of knowledge certain discourses will attain dominance. Hajer and Wagenaar (2003) refer to the most dominant of these as a ‘hegemonic discourse’. They suggest that the hegemonic discourse is usually the “entrenched position of the political-administrative elite” (Hajer & Wagenaar, 2003: 34). Hegemonic discourses are adept at precluding certain types of action that might erode the power of the political-administrative elite. This results in marginalisation of groups whose lives will be affected by decisions made by those who subscribe to the hegemonic discourse. Torgerson (cited in Hajer & Wagenaar, 2003: 34) suggests that it is important to challenge hegemonic discourses in order “to create reflective moments of policy discourse” and serve to open up the policy process.

2.5 Types of knowledge

According to the literature, all knowledge claims can be classified into three broad categories or groups, namely tacit, embedded, and codified (Gibbons *et al.*, 1994). This section provides the reader with a brief explanation of these three knowledge types in order to understand the types of knowledge that will be encountered in the research. It must be noted that overlaps between knowledge categories are possible and do occur. It is not unusual for an individual to hold all three types of knowledge on a variety of subjects.

2.5.1 Tacit knowledge

Tacit knowledge, often referred to as experiential knowledge is defined in contrast to codified expert knowledge (Callon, 1999). Gibbons *et al.*, (1994: 25) suggest that this type of knowledge “is learned on the job through training and experience”. This is a narrow definition of the term suggesting that tacit knowledge is embedded only in labour practices. There are other definitions of tacit knowledge that broaden its scope beyond labour practices. Bruckmeier and Tovey (2008: 320) contend that tacit knowledge, also referred to as lay knowledge, is “pluralised, situated, local”. Hey (2004: 5, 10) suggests “tacit knowledge is ephemeral, transitory ... notoriously difficult to ‘get a hold of’ and ‘retain’” as it is not codified. As the alternative terms suggest, this knowledge type is the domain of lay persons, gained from

experience, is usually contextually and locally specific and difficult to pass on to others. Such knowledge is held by everyone.

Michael (1992) provides insight into the various public (lay) discourses of science which are helpful in elucidating lay understandings of science. Based on his research, he suggests that there are generally two lay discourses of science: *science-in-general* and *science-in-particular*.

Science-in-general

The lay discourse of science-in-general presents science “as a coherent entity and emphasis is placed upon both the form of its activities and its knowledge domain of technological and natural phenomena” (Michael, 1992: 313). Within this discourse, science is viewed as exclusive, technical and practical and therefore beyond the ambit of laypersons. Science-in-general is depicted as mysterious and unfathomable and is “constituted through discourse about what it is not” (Michael, 1992: 320). Science-in-general is therefore socially constructed by lay persons as being about non-ignorance and non-subjectivity and this reinforces the hegemonic domain in which scientific knowledge claims operate.

Science-in-particular

This lay discourse speaks of particular instances of science and seeks, according to Michael (1992: 321), to “downplay the status of science - to shift the emphasis from the mystique of science to its mundane character”. Within this discourse, science is viewed in terms of its “specific types of knowledge, techniques and goals” (Michael, 1992: 321). This provides the rationale to interpret this particular discourse as falling within a division-of-labour discourse in which science-in-particular rests on the notion that science is only one function necessary to achieve a common aim or goal. Science therefore becomes socially constructed by lay people as a necessary, albeit complex component of knowledge.

Both of the lay discourses of science presented by Michael (1992) above, reinforce public understandings of people’s relationship with science, while simultaneously underscoring the orthodox relationship between science and society, in which all other knowledge claims are devalued in the face of scientific knowledge

2.5.2 Embedded knowledge

Embedded knowledge “is learned on the job through training and experience” (Gibbons *et al.*, 1994: 25). Thus, it can also be said to be locally and contextually explicit, largely embedded in a specific work context, and difficult to pass on. Gibbons *et al.*, (1994: 167) suggest that this type of knowledge “cannot move easily across organisational boundaries, its movement ... [is] constrained in a given network or set of social relations”. Transmission of this type of knowledge typically takes places through the movement of human resources, i.e. people switches. For example, this knowledge is held by mechanics, politicians, and municipal officials.

2.5.3 Codified knowledge

Codified knowledge is described by Gibbons *et al.* (1994: 25-26) as “proprietary knowledge ... subject to licensing and commercialisation ... practised by patents and trade secrecy and ... perceived as typical of business firms and also of military establishments”. A critical element of codified knowledge, according to Gibbons *et al.* (1994: 24) is that the process of its production “should be systematic enough to be written down and stored ... available to anyone who knows where to look”. For van Ewijk & Baud (2009: 220) a defining characteristic of codified knowledge is that it is “explicitly and systematically expressed”. Codified knowledge is, in layman’s terms, knowledge acquired through formal training and education, ratified or certified by professional bodies and formal learning institutions and signified through the acquisition of a formal degree or diploma. It is the domain of scientists and experts such lawyers, accountants, environmental practitioners, and engineers.

2.6 Discursive knowledge (discourses)

Knowledge is usually expressed and transmitted to others in either oral or written form. This expression and transfer of knowledge is thus discursive and is what is being referred to when one speaks of discourses. Discourses are socially constructed languages that give meaning to everyday life and occurrences. Discourses are embedded in language and allow those who subscribe to the discourse to interpret and understand information, while simultaneously defining the realm of possibility with regards to knowledge, problems and potential solutions (Dryzek, 2005).

Environmental knowledge is, like other knowledge types, often expressed in the form of discourses, which, according to Dryzek (2005: 9) “are bound up with political power”. Environmental discourses, therefore, have implications for the uptake of science into policy and the relationship between science, policy, and the public. Once an environmental discourse dominates to such an extent that it becomes a hegemonic discourse (Hajer & Wagenaar, 2003), it has the potential to entrench the political power of those who subscribe to it while simultaneously alienating those who do not. This can impact on the manner in which research aimed at informing policy, is designed and directed. By entrenching political power, discourses have the potential to preclude certain actions and to direct research aimed at providing the basis for policy. The power of environmental knowledge as embodied in discourses has received much attention from authors within the discipline of environmental politics (Dryzek, 2005; Hajer & Wagenaar, 2003; Innes & Booher, 2003). A further implication of environmental discourses arises from their ability to direct environmental policy-making by providing “a bias both in conceptualizing the policy problem at hand as well as the solutions that can be conceived for those problems” (Hajer & Versteeg, 2005a: 179).

In order to understand the environmental politics within the eThekweni Municipality in this case study, it is necessary to identify and analyse the competing discourses present in the decision-making around beach water quality management. Discourse analysis is a useful analytical tool for this purpose and will be covered in this section. Environmental discourses will also be discussed and linked to the typology of knowledge presented in the previous section. Finally, the concept of ecolabelling, a form of discourse that provides a narrative about a product, will also be explored. Ecolabels serve to confer some assurance of the environmental credentials of a product or service to consumers. In the tourism industry, they act primarily as a market mechanism (Aliraja & Rughooputh, 2004; Buckley, 2002; Gallastegui, 2002). The Blue Flag is an example of a tourism ecolabel aimed at attracting tourists who are concerned about the environmental quality of beach destinations.

2.6.1 Discourse analysis

The term ‘discourse’ is used in a number of contexts and has a range of meanings. To explore the theory of discourse analysis the term needs to be defined. Dryzek (2005: 9) provides the following definition of discourse:

“A discourse is a shared way of apprehending the world. Embedded in language, it enables those who subscribe to it to interpret bits of information and put them together into coherent stories or accounts. Discourses construct meanings and relationships, helping to define common sense and legitimate knowledge. Each discourse rests on assumptions, judgements, and contentions that provide the basic terms for analysis, debates, agreements, and disagreements”.

Hajer (1995: 45) provides an additional definition of a discourse as:

“... an ensemble of ideas, concepts, and categories through which meaning is given to phenomena ... As such discourse provides the tools with which problems are constructed”.

According to Hajer and Versteeg (2005a: 175), “discourse analysis sets out to trace a particular linguistic regularity that can be found in discussions or debates” and thus presents itself as a useful tool for understanding the discourses present in environmental policy-making processes occurring in the eThekweni Municipality. A critical assumption of discourse analysis is that individual worldviews are greatly influenced by language (Hajer & Versteeg, 2005a). Language plays a vital role in deliberative policy-making processes, as actors engage one another using an ‘argumentative rationality’ to ensure that their particular ‘positions’ are considered and incorporated into policy. Argumentative rationality in deliberative processes requires that stakeholders engage one another through potentially competing discourses: ‘argumentative discourses’ (Hajer, 2005). ‘Argumentative discourses’ are an essential component of deliberative processes since they are the means by which actors position themselves within the policy arena. Hajer (2005) suggests that a common way for actors to attempt to ensure their discourse is heard and understood is through use of ‘metaphors’ and ‘story lines’, described as “a condensed sort of narrative that connects different discourses” (Hajer, 2005: 448).

Within these policy-making settings it is not uncommon for actors to share similar views and understand or at least be able to relate to each other’s ‘story lines’. When actors can relate to each other’s ‘story lines’ there is a tendency to collaborate in order to give a particular view added weight in policy-making circles. Hajer (2006) refers here to the establishment of ‘discourse coalitions’, possible only when multiple actors can relate to and agree with each

other's story lines 'Discourse coalitions' can profoundly influence the policy-making process by making it difficult for a particular discourse to be ignored. A strong or large enough 'discourse coalition' can potentially become so dominant that the discourse its actors subscribe to can become hegemonic. 'Hegemonic discourses' can, over time, exert such influence that they become institutionalised (Brosius, 1999).

The institutionalisation of particular discourses, notably environmental discourses, is primarily a result of the link between environmental and development discourses, embodied in the discourse of 'sustainable development' (Brosius, 1999). This discourse, according to Escobar (cited in Brosius, 1999), has entrenched the perception that scientific knowledge is the only knowledge domain with authority to speak for the environment. The proliferation of environmental Non-Governmental Organisations (NGOs), each subscribing, in some way or another, to the discourse of 'sustainable development', profoundly influence the institutionalisation of the environment and of nature. This is because these institutions "inscribe and naturalize certain discourses ... creat[ing] certain possibilities for ameliorating environmental degradation ... [while] simultaneously preclud[ing] others ... privileg[ing] certain actors and marginaliz[ing] others" (Brosius, 1999: 38).

2.6.2 Environmental discourses

Growing environmental awareness and increasing contestation of environmental issues, especially within industrialised countries, has led to the politicisation of such issues (Dryzek, 2005). This has in turn resulted in increasing research and debate focussed on environmental politics. Environmental discourses present a useful concept for understanding public conceptions of science (and the environment) and its relationship with policy. Making sense of environmental discourses can potentially improve comprehension of the politics of environmental policy-making.

Dryzek (2005: 8) defines environmental politics as "the politics of the earth". Analysing and understanding environmental politics is challenging since there are no "well-defined boxes" within which environmental issues can be placed. Environmental problems, such as the issue of beach water quality management in Durban, are inherently complex since they are located at the intersection of two complex systems, environmental ecosystems and society (Dryzek, 2005). Furthermore, the manner in which environmental problems are discursively framed can

have a significant impact on their interpretation by others, both spatially and over time. The very same problem can be conceptualised by different individuals, groups, or institutions in starkly contrasting ways since “contests over meaning are ubiquitous, and the way we think about basic concepts ... can change quite dramatically over time”, with “the consequences for politics and policies on environmental issues [being] quite major” (Dryzek, 2005: 5). Hajer and Versteeg (2005b) term this condition ‘multi-signification’ which means that there are potentially multiple signals directing interpretation by different actors.

Since environmental politics is about meaning and contestation over the framing of the environmental problem or issue at hand (Brosius, 1999), a useful approach to understanding such politics is to undertake a discourse analysis. Moreover, because “the impact of a discourse can often be felt in the policies of governments or intergovernmental bodies, and in institutional structure” (Dryzek, 2005: 20), environmental politics related to the beach water quality management policies of eThekweni Municipality can be interpreted through the lens of discourse analysis.

The importance of a particular discourse and the degree to which it is accepted and used by actors is dependent largely on the manner in which it is framed. Discourses are influential because they provide the ontological assumptions that frame the issue at hand and thus determine the realm of possibilities and potential solutions available to researchers and the public at large. Discourses can therefore be said to be “bound up with political power” (Dryzek, 2005: 9). This in turn influences the relationship between science and society and has ramifications for the way in which science is perceived by a public that potentially subscribes to a broad spectrum of discourses.

In this research it is proposed that there are many types of knowledge that provide alternative, and potentially contrasting, understandings of an environmental issue (Callon, 1999). The focus in this study is on beach water quality in Durban as an environmental knowledge issue or controversy requiring management in coastal zone governance or ICM. It is here argued that multiple alternative discourses exist among knowledge holders of each knowledge type.

Dryzek (1997) distinguishes between three sets of environmental discourses that have been historically prominent and institutionalised: problem-solving discourses; survivalism discourses; and sustainability discourses focussed on green radicalism. This research focuses

on the problem-solving discourse which can be further broken down into ‘administrative rationalism’, ‘democratic pragmatism’, and ‘economic rationalism’ (Dryzek, 1997). A link can be discerned between these three discourses and Callon's (1999) models of knowledge production. In each discourse a particular knowledge type is dominant. These three discourses therefore warrant a brief description.

Administrative rationalism

The discourse of administrative rationalism is a ‘leave-it-to-the-expert’ approach (van Heerden, 2008). The ‘public deficit model’, in which the public is assumed to be unable to meaningfully contribute to a solution is one such example of this discourse (Dryzek, 1997). This model could also be termed PEM (Callon, 1999). According to Dryzek (1997), there are a number of practices and institutions within which the administrative rationalism discourse is evident. Environmental Impact Assessment (EIA), a systematic, check list approach to assessing and predicting environmental impacts, is one such manifestation of the discourse, as it is an expert-led process (Dryzek, 1997). Others include resource-management institutions, pollution control agencies, regulatory policy instruments, and expert advisory commissions. By seeking to ‘leave-it-to-the-experts’ the discourse “abdicate[s]...public authority in favour of unrepresentative private interests powerful enough to secure a place in the dialogue” (Dryzek, 1997: 96). Citizens are largely denied an opportunity to participate in decision-making circles, effectively constraining and possibly preventing an expansive democracy from being realised. Expert, scientific knowledge dominates this discourse.

Democratic pragmatism

According to Dryzek (1997) the discourse of democratic pragmatism is characterised as being an interactive problem-solving discourse. A critical assumption of the discourse is that all citizens enjoy equality and have the “right to exert political pressure, be they scientists, elected officials, pressure group leaders, ordinary voters, or ordinary non-voters” (Dryzek, 1997: 114). Emphasis is therefore placed on the inclusion of all role-players in the decision-making and problem-solving arena. Democratic pragmatism seeks to democratise decision- and policy-making while attempting to address some of the shortcomings of the administrative rationalism discourse. Callon's (1999) PDM and CKM provide good examples of a continuum in which the principle of democratic pragmatism is embodied, with CKM being the more democratic of the two. There are many ways in which the presence of this discourse is made apparent. The public consultation component of EIA is an example of this discourse because this is the point

at which information is sought from a variety of perspectives, via the public (Dryzek, 1997). Other devices include alternative dispute resolution, policy dialogue, lay citizen deliberation, public inquiries, and right-to-know legislation. A crucial premise of this discourse is the emphasis placed on “interactive problem solving involving participants within government and outside it” (Dryzek, 1997: 108). Democratic pragmatism focuses on governance and not government and is therefore able to constructively contribute to deliberation in the ‘network society’.

Economic rationalism

Dryzek (1997) defines economic rationalism as a ‘leave-it-to-the-market’ approach to problem-solving. This discourse advocates for a market-driven response to decision-making, allowing the market to provide suitable solutions (van Heerden, 2008). This discourse has achieved prominence in most of the world and has fallen under a multitude of labels, from neoliberalism to free-market conservatism and even to Thatcherism and Reaganomics (Dryzek, 1997). Economic imperatives are prioritised in this discourse, achieved through economic policy promoting laissez-faire economics. Governments and NGOs throughout the world make use of this discourse (Dryzek, 1997). In its most radical form the discourse promotes the privatisation of everything (including the environment) and stresses the benefits that can accrue when the prices are right and property rights are in place. Within this discourse, environmental problems are viewed as resulting from a failure to establish the correct prices or property rights, and not from private economic interests (Mitchell and Simmons 1994, cited in Dryzek, 1997). Responsibility for environmental problem is thus abdicated. A tenuous link is evident between Blue Flag, a tourism ecolabel and market mechanism, and this discourse.

How environmental discourses are taken up by governments, institutions, and the public and included in policy is a complex process and in many cases involves the creation of an environmental brand which is justified by its adherence to particular standards, norms and indicators. One way of reinforcing a specific environmental commodity or product is through the creation of ‘ecolabels’.

2.6.3 Ecolabels

Ecolabels can be conceptualised as an environmental discourse since they attempt to confer some assurances of the environmental legitimacy of a commodity and its production processes.

In so doing, they create an environmental storyline about a product, which, according to Dryzek (2001: 661) is an important characteristic of any discourse since “any discourse will have at its center [sic] a storyline, which may involve opinions about both facts and values”. The BFP is an ecolabel that relates to the manner in which beaches and marinas should be managed. Furthermore, it is a tourism ecolabel, since at its core lies the overriding goal to attract people to beaches. Understanding tourism ecolabels is necessary in order to more fully understand the politics surrounding eThekweni Municipality’s decision to leave and then re-enter the programme.

The past decade has witnessed the rapid expansion of ecolabelling of commodities, processes and even whole tourist destinations. Ecolabels are generally an attempt to confer assurances of environmental soundness to potential consumers, with Buckley (2002: 184) suggesting that “an ecolabel is simply one whose content refers principally to the environment”. Gallastegui (2002: 316), provides a slightly more detailed definition, positing that “eco-labelling seeks to inform consumers about the effects on the environment of the production, consumption and waste phases of the products/ services consumed”. Ecolabels can refer to the state of the natural and social environment, the environmental impacts of a production process or the service or product, or even to the “environmental management or performance measures” involved in the production process (Buckley, 2002: 184). They can be found in almost all sectors and are prominent in the tourism sector where there is a proliferation of tourism brochures marketing some form of ecotourism and nature-based tourism activities, with varying degrees of ‘spin’ on the issue of sustainability or sustainable development. Additionally, ecolabels can be found in a range of membership and accreditation schemes for products and services, where membership denotes compliance with the necessary criteria, some of which are related to the environment, for example the Forestry Stewardship Council (FSC), the Carbon Reduction Label, and Fairtrade (Ecolabel Index, n.d).

Within the tourism sector, both “domestically and internationally, the main function of ecolabels...is as a market mechanism” (Buckley, 2002: 185) with the Blue Flag Ecolabel being an example of an environmental accreditation scheme operating at a regional or global scale that is frequently used by tourism agencies and departments as a marketing tool for beach tourism. Indeed, Thomsen (2001, cited in Aliraja & Rughooputh, 2004: 2) makes the following assertion about the link between the Blue Flag Ecolabel and tourism:

“The BF [Blue Flag] has become a very recognized symbol in Europe; tourists and tour operators identifying the Flag as a symbol of clean, safe and environment-friendly managed coastal areas. An increasing number of tourists are therefore asking for Blue Flags before choosing their holiday destination”.

While ecolabels have been touted as a potential mechanism to shift consumer behaviour towards more sustainable consumption patterns and therefore to protect the environment, the literature reveals that there are concerns around the legitimacy and credibility of the environmental claims and the accreditation or certification procedures and requirements, especially with regards to tourism ecolabels (Buckley, 2002; Gallastegui, 2002). Lack of standardisation or consensus about the requirements for ecolabelling of products, services, processes and destinations is concerning (Buckley, 2002; Gallastegui, 2002; Teisl *et al.*, 2002). Nevertheless, ecolabelling as a form of environmental discourse is still widely used to convey messages of environmental sustainability and environmentally benign production processes. Additionally, within the tourism sector, they are frequently cited and used for marketing appeal (Buckley, 2002).

2.7 Conclusion

As society becomes progressively more complex, so too do the problems that need to be faced, particularly environmental problems. In an attempt to provide acceptable solutions to increasingly thorny struggles, knowledge domains other than science are being called on to contribute to knowledge production processes.

Over the past four decades, there has been a gradual move from government to governance. The suggestion is that this shift is a necessary adaptaptation to the increasing complexity of society and the need for socially accountable decsions and policies (Callon, 1999; Whatmore, 2009). A global socio-economic transformation has seen the transition to what is referred to as a ‘network society’ (Castells, 2000; Hajer & Wagenaar, 2003; Innes & Booher, 2003) where knowledge is commodified and thus traded. Knowledge based information is key and is traded in the ‘network society’. This commodification has entailed a move away from traditional, centralised knowledge production, Mode 1, to a more inclusive and collaborative form of knowledge production involving a greater number of actors, Mode 2.

The literature reviewed suggests that an historical over-reliance on codified knowledge which excludes lay people, is giving way to a growing acceptance of the need to incorporate more embedded and tacit knowledge into decision- and policy-making (Gibbons, *et al.*, 1994; van Ewijk & Baud, 2009).

Knowledge production can be thought about through discourses which confer meaning on commonplace life occurrences and can be regarded as a “shared way of apprehending the world” (Dryzek, 2005: 9). Environmental discourses offer ways of understanding environmental politics and assist one to make sense of the relationship between politics and the environment. The environmental controversy that followed public awareness of the contamination of Durban’s beach water with pathogenic pollutants was a basis for the emergence of a range of environmental discourses which are investigated in this thesis. In this regard, the notion of the BFP as an environmental ecolabel and also as a tourism ecolabel are conceptual ideas that can be used to engage in the debate around beach water quality management. In the following chapter, the context of the study is explored.

CHAPTER 3

CONTEXT OF THE STUDY

3.1 Introduction

The coastal zone, home to the beaches of the world, is a unique space in which land and sea meet and houses a significant portion of the global population with “humans ... [now] disproportionately dependent on the coastal zone for living space and recreation” (Weinstein *et al.*, 2007: 43). Furthermore, the coastal zone is a highly complex biophysical environment, rich in biodiversity, providing livelihood and economic opportunities for its inhabitants (DEA, 2014; Goble *et al.*, 2014; Martínez *et al.*, 2007). Coastal zones around the world need to be effectively and efficiently managed because of their pivotal importance for life. The South African coastal zone is no different, and in the context of the city of Durban, the beaches are a major tourist attraction and a cornerstone of the marketing and promotion of the eThekweni Municipality (DEA, 2012; Maharaj *et al.*, 2006). This thesis aims to explore the political contestation regarding the beach management systems employed by the eThekweni Municipality over the past 12 years, with a focus on sea water quality.

This chapter presents the contextual framework within which the research has been conducted. It comprises a number of dimensions, all of which act to situate the research. Section 3.2 provides a brief overview of the eThekweni Municipality, in which the city of Durban is located. The geo-physical context of the study area is explored and the historical and contemporary links between the city’s beaches and tourism are presented. Durban’s climate and the implications thereof for managing its beach water quality is briefly described.

Coastal governance is the focus of section 3.3. The international and national policies of coastal governance are reviewed. This is done by exploring the development of ICM and by discussing ICM implementation principles, both internationally and locally. Discussion on ICM in South Africa necessitates inclusion of a brief description of the ICM Act (RSA, 2008)³ and its implications for the way in which the South African coastal zones are managed.

³ This document is referred to throughout this chapter as the ICM Act.

In section 3.4, the Blue Flag Programme (BFP) and its criteria for accreditation are presented. This is achieved by initially describing the rationale behind establishment of the voluntary eco-label by the FEE and then by tracking its implementation in Europe and South Africa. Durban's experiences with the BFP are described. Links between the BFP and tourism are also explored. Finally, this section moves to a description of eThekweni's in-house beach management system which was developed after the Municipality decided to leave the BFP.

Lastly, section 3.5 presents the regulatory and scientific context of marine water quality monitoring, both internationally and locally. This is achieved by reviewing three official water quality policy directives and guidelines, at a global, regional, and national scale:

1. World Health Organisation (WHO) Guidelines for safe recreational water environments, Volume 1: Coastal and freshwaters (*World Health Organisation, 2003*)⁴;
2. European Union (EU) bathing directive 2006/7/EC (*Council of European Community, 2006*)⁵;
3. South African (SA) Water Quality Guidelines for Coastal Marine Waters, Volume 2: Guidelines for recreational use (*Department of Eenvironmental Affairs, 2012*)⁶.

3.2 eThekweni Municipality

The eThekweni Municipality was established in 2001 when the Municipal Demarcation Board revised the administrative boundaries for local government and created wall-to-wall municipalities across South Africa. eThekweni is therefore the administrative name for the management area in which the city of Durban is the main urban feature, located on South Africa's east coast. The study area is the central beaches of Durban, known as the 'Golden Mile'. It is bound by the uMgeni river mouth to the north and Durban's harbour mouth to the south, a linear distance of approximately 6km (Fig. 3.1). Where the 'Golden Mile' initially referred only to the central beaches of Durban, it is used here to refer to the extent of the study area.

⁴ This document is referred to throughout this chapter as the WHO guidelines.

⁵ This document is referred to throughout this chapter as the EU guidelines.

⁶ This document is referred to throughout this chapter as the SA guidelines.

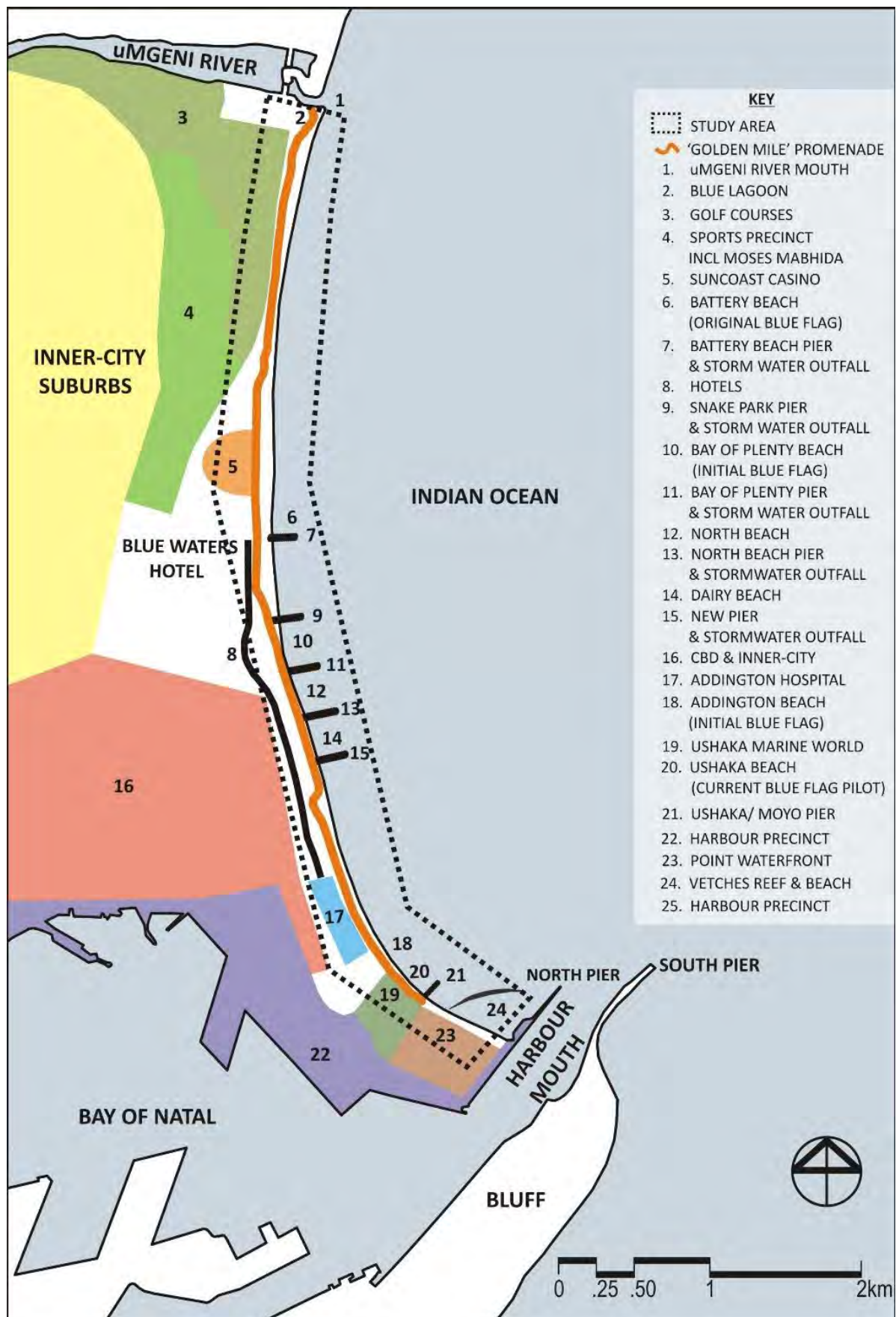


Figure 3.1. A schematic representation of the study area, including Durban's inner-city suburbs, CBD and Golden Mile

3.2.1 Socio-economic context

eThekweni is located in KwaZulu-Natal (KZN) province, which is the second largest provincial contributor to national GDP, accounting for around 16.6% of South Africa's R4 trillion annual GDP (KZN Provincial Treasury, 2013). Of this provincial contribution, eThekweni accounts for approximately one third, or R213 billion and is home to over 3.5 million people, or one third of the provincial population (KZN Provincial Treasury, 2013; SSA, 2012). The Bay of Natal, commonly known as the Durban harbour (Fig. 3.1), is found on the southern border of the study area and is South Africa's busiest cargo terminal (Guastella, 1994; Nel *et al.*, 2003). This harbour has historically generated significant economic activity, resulting in Durban following an economic path based on industrial and commercial development around the harbour. However, from the 1960s, a declining production industry has seen a shift to the service industry with the tourist trade becoming a "particular characteristic of Durban" (Freund, 2002: 17).

3.2.2 Climatic context

There are a number of factors that make Durban a favourable tourist destination, most notably its subtropical climate and beaches (Mardon & Stretch, 2004; Preston-Whyte & Scott, 2007). Durban's climate is relatively wet and warm in comparison to other regions in South Africa. Using data for the previous 54 years, the average annual rainfall is approximately 970mm, twice the national annual average of 464mm (eThekweni Municipality Drainage & Coastal Engineering, 2014). Durban receives more than two thirds of its annual rainfall in the spring and summer period, October to March, which is also characterised by average high temperatures of approximately 26°C (SAWS, 2010). High temperature and relatively high rainfall result in relatively humid summers. Winter, from June to August, is comparatively milder and drier, accounting for approximately 120mm of the annual rainfall, while being characterised by an average high temperature of 23°C (eThekweni Municipality Drainage & Coastal Engineering, 2014; SAWS, 2010).

3.2.3 The implications for tourism

The warm Agulhas current found on Durban's east coast moderates the temperature of the coastal waters, keeping them relatively warm year-round and making them ideal for contact recreation activities such as surfing and bathing. This subtropical climate, characterised by fairly high rainfall, high humidity, and high land and sea temperatures, has implications for

beach use and management because increased run-off in the rainy season periodically enters the beaches via storm water outlets that drain the inner-city and which are located the central beaches (Fig. 3.1) (Mardon & Stretch, 2004). Increased rainfall in river catchments also results in increased discharge from the uMgeni River. Durban's warm climate makes its beaches a year-round tourist attraction, although summer is the peak tourist and bathing season, creating a challenge for beach managers as they have to contend with the potential contamination of sea water associated with higher run-off during the busiest bathing season.

The economic impact of tourism is well researched. Tourism is already a significant contributor to the economy of many countries, with the major benefit being job creation since it is typically a labour-intensive industry (Maharaj *et al.*, 2006). Globally, "tourism is widely recognised as an instrument of local economic development" (Agarwal *et al.*, 2000, cited in Rogerson, 2002: 95). In South Africa too, tourism has been identified as a vehicle for LED (Kaplan, 2004; Maharaj *et al.*, 2006; Nel *et al.*, 2003). One of the reasons tourism is touted as an instrument of LED is its multiplier effect: the increased revenue resulting from an injection of money into a particular locality or tourism space. Tourism, and urban tourism in particular, is thus seen as an effective and necessary instrument for delivering LED, especially in the developing world (Rogerson, 2002).

Both the KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA) and eThekweni are acutely aware of the potential economic benefits of tourism, and the 'Golden Mile' beaches are seen as a major tourism asset to both the province and the municipality (eThekweni Municipality, 2012; KZN Economic Development, Tourism and Environmental Affairs, 2011). Durban's beaches are now a recurring theme in the marketing material utilised by the municipal and provincial tourism departments, with a number of events located on the 'Golden Mile' (Durban Tourism, 2013; Maharaj *et al.*, 2006; Mbuso, 2013; Nxele, 2014). According to Durban Tourism, the designated tourism authority in the municipality, tourism in Durban contributes approximately three percent annually to the municipal economy, equivalent to R5.7 billion (Durban Tourism, 2013; eThekweni Municipality, 2012).

To harness the economic potential of the 'Golden Mile' beaches in a sustainable manner, it is imperative that the entire coast is effectively governed. An exploration of coastal governance

policy and legislation, and the implications thereof for eThekweni are presented in the following section.

3.3 Coastal governance policy and legislation

Coastal governance can be loosely described as the act of managing or governing the coast, and has been part of coastal management policy since the 1970s (Bremer & Glavovic, 2013). Over the years, coastal governance has taken many guises, evolving from a bureaucratic and technocratic approach requiring scientific knowledge, to one emphasising participatory techniques that seek to include human development needs in management decisions (Bremer & Glavovic, 2013; Glavovic, 2002). Coastal governance in South Africa has undergone similar transformations to those experienced globally and South Africa currently subscribes to the ICM paradigm which is legislated through the ICM Act.

3.3.1 The international context

The importance of the coastal zone has long been recognised. Discussion around its management and governance can be found in literature produced over the past five decades, with Coastal Zone Management (CZM) first making its way into the literature in the 1969 Stratton Commission Report (Bremer & Glavovic, 2013). The CZM approach favoured a technocratic, science-based perspective, centred on the underlying assumption that a focus on science and technology would result in improved management (Bremer & Glavovic, 2013). Improved knowledge of the coastal zone has led to a deeper understanding and appreciation of the complexity of this space, resulting in a shift towards an interdisciplinary management approach, transforming CZM to ICM (Bremer & Glavovic, 2013; Celliers *et al.*, 2013).

The 1992 Rio Earth Summit laid the foundation for the contemporary concept of ICM, setting an ambitious target for all coastal nations to have ICM programmes implemented by 2000 (Bremer & Glavovic, 2013; Celliers *et al.*, 2013). The evolving approach of ICM marks a “shift away from models of resource management toward models of governance” (Bremer & Glavovic, 2013: 41) and today favours an ecosystem based approach, with humans being an assumed element of the coastal ecosystem. As a governance paradigm, ICM acknowledges “that knowledge is not concentrated within any one group of stakeholders or institution, but diffused throughout the entire community” (Bremer & Glavovic, 2013: 48) and emphasises the need for “active and sustained involvement of the interested public and many stakeholders with

interests in how coastal resources are allocated and conflicts are mediated” (Celliers *et al.*, 2013: 72). While there are a number of ways to ensure active and sustained involvement, integration and coordination are central requisites of the ICM approach (Celliers *et al.*, 2013). The focus on integration across knowledge bases and the imperative for cooperation and collaboration between scientists, policymakers, managers, and the public poses a potential challenge for ICM implementation and operationalisation. One reason for this difficulty is that sustained and effective input from the public requires a sufficiently knowledgeable public (Celliers *et al.*, 2013). Additionally, integration of disparate knowledge systems and knowledge types poses significant challenges, especially with regards to validating knowledge, and can be time-consuming (Bremer & Glavovic, 2013). Finally, there is a potential disconnect in the temporal scales required for each profession to make decisions: policymakers and managers have shorter timeframes than scientists, in which to arrive at decisions (Bremer & Glavovic, 2013). However, the robustness of governance can potentially be enhanced through integration, making working at these problems worthwhile, especially in the presence of a sector-based governance system like South Africa (Taljaard *et al.*, 2012).

3.3.2 The South African and Durban context

South Africa has embraced the ICM approach since the 1990s and recently legislated it as a coastal management approach through the ICM Act (Celliers *et al.*, 2013; RSA, 2008). Historically however, the imperatives of coastal governance were implemented on an *ad hoc*, sectoral basis, with coastal and marine activities such as “nature conservation, fisheries management, land-use planning, and the construction and maintenance of coastal infrastructure” (Glavovic, 2002: 2) conducted in an uncoordinated manner not cognisant of the complexity of the coastal zone and the interrelationships between these activities (Glavovic, 2006b). Progression from *ad hoc*, sectoral management of the coast that characterised apartheid South Africa, towards an integrated, development-oriented, and people-centred approach, culminated in the White Paper for Sustainable Coastal Development in South Africa (referred to hereafter as the White Paper) (Celliers *et al.*, 2013; Glavovic, 2002, 2006a, 2006b; RSA, 2000).

The White Paper paved the way forward for CZM and eventually ICM in South Africa by advocating a shift from “a predominantly biophysical and bureaucratic [approach] ... into a participatory approach driven by human development imperatives and the need to promote

sustainable livelihoods” (Glavovic, 2006b: 889). In so doing, it shifted CZM from a resource-management approach to one of sustainable development (Glavovic 2006a; Goble *et al.*, 2014). It sought to balance environmental protection with human development needs in order to redress uneven development, while reaffirming a commitment to sustainable development (Glavovic, 2006a).

The ICM Act, which stems from the White Paper (RSA, 2000), “promotes a more holistic or ecosystem based approach whereby the coast is managed as a unit, encompassing all elements that have historically been fragmented and addressed by the various statu[t]es” and attempts to align South African ICM policy “with global issues such as climate change” (Goble *et al.*, 2014: 36-37). The majority of environmental legislation in South African is people-centred, ensuring that people benefit from environmental management. The ICM Act falls under the ambit of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) (RSA, 1998).

The ICM Act legislates the establishment of a number of coastal management mechanisms or instruments that “facilitate cooperative coastal governance as well [as] integrated planning” (Celliers *et al.*, 2013: 75). To facilitate cooperative governance, the ICM Act stipulates that a number of instruments are developed in all three spheres of government, i.e. at national, provincial and municipal level, and that there is consistency between the three spheres (Celliers, *et al.*, 2009). Examples of such instruments are coastal management programmes (CMPs) and coastal committees. While these are the main statutory instruments required by the ICM Act they are not the only instruments and the Act is also cognisant of the interaction between these instruments and other statutory and non-statutory tools such as Integrated Development Plans (IDPs), beach management programmes, estuary management plans, storm water management plans, catchment management plans and even LED plans.

Responsibility for the governance of the coastal zone of South Africa is decentralised and devolved to the local municipal level with policy directives being set by national and provincial government (Goble *et al.*, 2014). Thus, in the context of the study, the eThekweni Municipality is mandated to implement ICM, with assistance from the provincial environmental authority, the KZN EDTEA. Regarding the development of CMPs, “arguably the most powerful integrating instruments in an ICM toolbox” (DEA, 2014: iii), the ICM Act seeks to ensure that CMPs developed at each level of government are coherent and consistent with one another, i.e.

the Municipal Coastal Management Programme (MCMP) should align with the Provincial Coastal Management Programme (PCMP) which should align with the National Coastal Management Programme (NCMP) (Fig. 3.2).

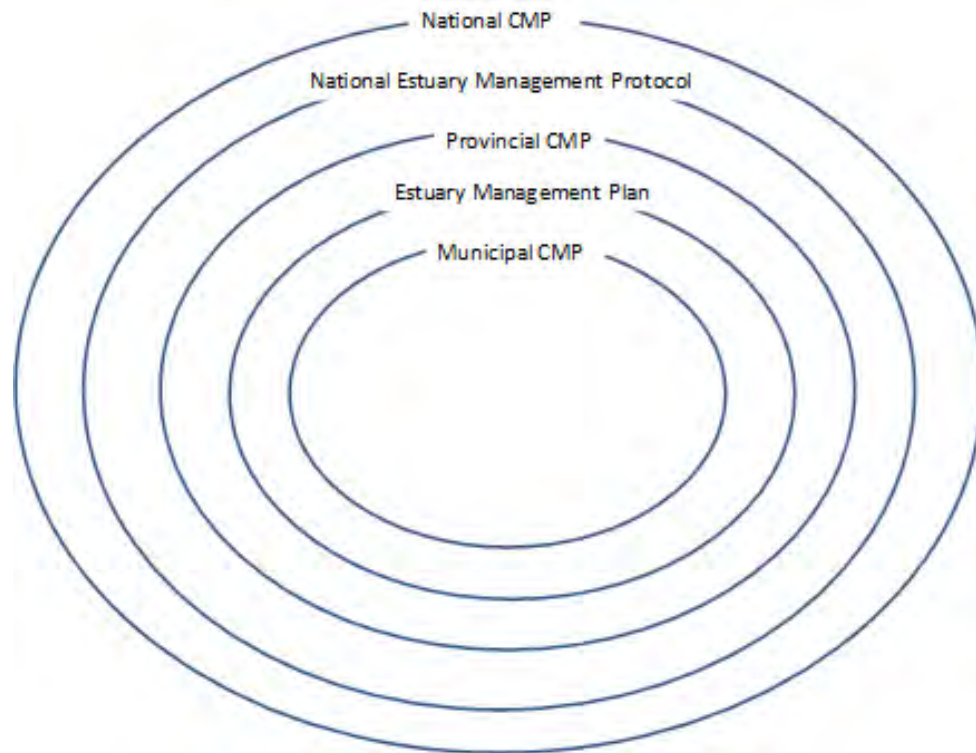


Figure 3.2. Conceptualisation of the intention of the ICM Act in relation to CMPs (Celliers, unpublished)

Progress on the development of CMPs in South Africa has been slow and none have made the deadline as per the requirements of the ICM Act. This is due in part to delays in developing the NCMP, which was only published in 2014 (DEA, 2014). This has ramifications for coastal provinces and municipalities who require policy directive from the NCMP before developing their own CMPs to ensure compliance with the ICM Act. In addition to being slow, progress among municipalities with the implementation of ICM Act requirements has been mixed, with better capacitated coastal municipalities, such as eThekweni, generally making more progress than less capacitated municipalities (Goble *et al.*, 2014). For example, eThekweni has made more progress than most coastal municipalities in terms of some of the other requirements of the ICM Act but is yet to fully develop its own MCMP.

CMPs are, by definition, holistic programmes that aim to provide effective policy directive on how the coast should be managed. As such they would be expected to cover a broad range of

focal areas. Additionally, they would also be expected to vary from one coastal zone to another as they take cognisance of locally specific contexts. The BFP is a holistic beach management approach that seeks to incorporate all elements of a beach into a management plan to ensure effective and integrated management, and could be considered a component of a CMP.

3.4 The Blue Flag Programme

The Blue Flag eco-label is a symbol of international accreditation awarded by FEE to beaches and marinas that comply with numerous criteria and standards, mostly focused around user safety (FEE, 2014). Accreditation signifies that the beach or marina is safe for recreational use (FEE, 2014). The BFP is well established with accreditation awarded to more than 4 000 beaches and marinas in 48 countries around the world (FEE, 2014). It has been argued that Blue Flag accreditation is a boon for tourism since holiday makers can plan beach holidays around beaches that are accredited because compliance with these standards is deemed a good indicator of beach safety, cleanliness, and enjoyment (Buckley, 2002; FEE, 2014; Nahman & Rigby, 2008).

The Blue Flag is a voluntary accreditation scheme intended to confer a message of good environmental governance, while also providing assurances on bathing water quality and the type of facilities present (Buckley, 2002; FEE, 2014).

3.4.1 The international context

The BFP was developed by the FEE in France in 1985 with the original objective of ensuring that French coastal municipalities complied with sewage treatment and bathing water quality guidelines (FEE, 2007). Two years later, in 1987, the European Year of the Environment, the BFP was officially launched in Europe, and criteria in addition to water quality were included. As a widely recognised eco-label, the Blue Flag has often found its way into literature on tourism and frequently appears in tourism brochures around the world (Buckley, 2002).

The BFP requires that beaches meet 33 criteria covering four main areas, namely, environmental education and awareness, water quality, environmental management, and safety and services (see Appendix A for the full set of criteria). However, since this research is primarily concerned with water quality, the water quality criteria have been extracted from

of Appendix A and listed on the following page in Table 3.1, with the microbiological limits listed below this in Table 3.2.

Table 3.1. Blue Flag water quality criteria (imperatives for all regions) (FEE, 2014)

Water quality	
29	The beach must fully comply with the water quality sampling and frequency requirements
30	The beach must fully comply with the standards and requirements for water quality analysis
31	No industrial, waste-water or sewage-related discharges should affect the beach area
32	The beach must comply with the Blue Flag requirements for the microbiological parameter <i>Escherichia Coli</i> (faecal coli bacteria) and intestinal <i>Enterococci</i> (<i>Streptococci</i>) (see Table 3.2 below for microbiological limits)
33	The beach must comply with the Blue Flag requirements for the following physical parameters (imperative for all regions) : <ul style="list-style-type: none"> · There must be no oil film visible on the surface of the water and no odour detected. On land the beach must be monitored for oil and emergency plans should include the required action to take in case of such pollution. · There has to be an absence of floatables such as tarry residues, wood, plastic articles, bottles, containers, glass or any other substance.

Table 3.2. Blue Flag limits of microbiological pathogens in beach waters (FEE, 2014)⁷

Parameter (Common name)	Coastal and transitional waters Limit values	Inland waters Limit values
<i>Escherichia Coli</i> (Faecal <i>Coli</i> bacteria)	250 cfu/ 100ml	500 cfu/ 100ml
Intestinal <i>Enterococci</i> (streptococci)	100 cfu/ 100ml	200 cfu/ 100ml

In order to be awarded a Blue Flag, the respective beach must comply with all 33 criteria for the duration of the intended bathing or recreation season. Weekly monitoring of marine water quality at accredited beaches is required for the duration of the Blue Flag (bathing) season. In the case of eThekwin, owing to the year-round warmth of the subtropical climate, the bathing season lasts all year and compliance is therefore required year-round. This is in contrast to the Western Cape where the typical bathing season at most beaches only lasts for the duration of the summer, approximately three months. Arguably compliance in eThekwin's case is a more challenging endeavour (Knowledge for Coastal Change Meeting 1, 12/03/2013).

3.4.2 The South African and Durban context

In 2001, eThekwin became the first coastal municipality outside of Europe to implement the BFP on its beaches (FEE, 2007; Pullan, 03/01/2009). Initially driven by the CoastCare

⁷ The contents of this table are explained in detail between pages 49 and 51.

initiative of the South African Department of Environmental Affairs and Tourism (DEAT), the administration of the South African BFP is now the mandate of the Wildlife and Environment Society of South Africa (WESSA), a national environmental NGO (Rosenberg, 2009). This is in accordance with the requirements of FEE which stipulate that a national NGO should run the programme in each member country.

Initially, the sole eThekweni beach with Blue Flag accreditation was South Beach (Fig. 3.1) (Bisetty, 08/07/2004; Fourie, 04/07/2012). Between 2002 and 2006, eThekweni embarked on an expansion of the BFP, with five beaches being awarded either pilot or full status for the 2005/ 2006 season, namely, Anstey's Beach, Addington Beach, South Beach, Bay of Plenty Beach, and uMhlanga Main Beach (Fig.3.1) (Metro Reporter, 29/10/2004; Nzama, 28/10/2005). eThekweni were strong advocates of the initiative and the Blue Flag was flown over the beaches during this time, providing local, national, and international users with assurances of good, safe recreational beaches (Gangaram, 26/10/2004; Metro Reporter, 29/10/2004; Nzama, 28/10/2005).

Between 2006 and 2008, eThekweni began to experience difficulty complying with the Blue Flag criteria, mainly those relating to water quality but also with regard to maintenance of facilities, and litter on the beaches (De Boer, 20/11/2007, Pillay, 27/11/2006; Robertson, 30/11/2006). A variety of reasons were provided by eThekweni for its perceived inability to manage the water quality at its beaches in accordance with the BFP, giving rise to debates about the relevance of the standards for subtropical climates, the subjective application of standards by WESSA and the Blue Flag organisation, the Eurocentric approach of the BFP, and even a suggestion that applying Blue Flag selectively to beaches that could qualify would entrench apartheid era planning (Carnie, 16/05/2008, 14/03/2008, 25/03/2008; "City manager defends Blue Flag status", The Witness, 25/03/2008; Tolsi, 03/04/2008).

In 2008, after failing to adequately deal with the non-compliance issues relating to water quality, eThekweni had accreditation at five out of six beaches removed by the BFP, with only uMhlanga's Main Beach still able to meet all the Blue Flag's compliance criteria (Jones, 12/07/2008). In light of this loss of accreditation, eThekweni voluntarily withdrew all of its beaches from the BFP. Once the media became aware of eThekweni's withdrawal from the programme, the issue was firmly placed within the public domain and met with disdain from many corners of Durban's civil and professional societies (Batten, 03/07/2008; Jones,

08/11/2008; Packree, 12/12/2007; Savides, 01/11/2009). eThekwini responded by publicly discrediting the BFP (Carnie, 25/03/2008), again raising debates regarding the relevance of the standards for subtropical climates, the subjective application of the criteria, and the Eurocentric and North-driven nature of the BFP which was not receptive to developing country concerns (Attwood, 25/04/2010; Mbuyazi, 27/10/2010). The issue became politicised and the Municipality and WESSA began to engage one another via the media, with the municipal manager at the time, Michael Sutcliffe, calling for removal of Alison Kelly, coordinator of the Blue Flag South Africa Programme (Carnie, 25/03/2008; Padayache, 29/06/2010).

Following the decision to withdraw from the BFP, eThekwini instituted an alternative, in-house system focusing on water quality and driven by the Municipal Water and Sanitation Department (Carnie, 06/08/2008; Chetty, 13/11/2009).

eThekwini Municipality in-house marine water quality and beach management approach

The eThekwini in-house beach management approach (referred to in this thesis as the Municipal Programme) aims to ensure that all municipal beaches are managed according to “the same standards, with the emphasis on clean water and safe swimming conditions – as well as lifeguards of equal calibre on every beach” (Ryan, 04/05/2008).

It is difficult to find any official documentation on the Municipal Programme but some aspects have been mentioned in the popular press and this information can be supplemented through data obtained during interviews (De Boer, 16/05/2008; Gounden, 15/11/2008; Ryan, 04/05/2008). The Municipal Programme focuses on water quality, measured against standards which were set by the Municipality, and information sharing to enable informed decision-making, and is managed by the Municipal Water and Sanitation Department. It involves sampling and testing beach water quality at the Municipality’s South African National Accreditation System (SANAS) accredited laboratory, on a weekly basis, which is more frequent than the Blue Flag requirement of every two weeks (FEE, 2014). Beaches are graded into four categories according to microbiological (Table 3.3) and physical (litter) (Table 3.4) parameters. These standards have been a source of controversy and have been publicly challenged in the popular press (Carnie, 14/03/2008).

Table 3.3. Microbiological limits used by eThekweni Municipality (Beach Water Quality, 2014)

Category	<i>Enterococci</i> (count per 100 ml)	<i>Escherichia Coli (E. Coli)</i> (count per 100 ml)
Excellent	≤ 100	≤ 100
Good	101-300	101-300
Moderate	301-2000	301-2000
Poor	≥ 2000	≥ 2000

Table 3.4. Litter index used by eThekweni Municipality (Beach Water Quality, 2014)

Litter items on the beach	Test Value	Report Card
0	A+	Very clean
1-3	A	Clean
4-10	B	Moderately clean
11-25	C	Dirty
>25	D	Very Dirty

These tables show microbiological and physical parameters used to grade eThekweni's beaches. Under this grading scheme, an 'excellent' beach, marked with a symbol of a little blue fish, has less than 100cfu/ 100ml of both *E. Coli* and *Enterococci* and a litter index value of 'A' or 'A+'. All measurement of both water quality and beach litter is conducted by Municipal employees.

Results are published on public notice boards at all municipal beaches (Fig. 3.1), along with explanations of the indices used, and also on the city of Durban website (www.durban.gov.za), enabling users to make informed decisions about whether to enter the sea (De Boer, 14/03/2008; Ryan, 04/05/2008). However, at the time of writing, the website appears to have last been updated more than two months previously. Figure 3.3 shows that the signage at North Beach is also out of date.

According to some authors, the standards set by the Municipality "closely mirror the Blue Flag water quality and public facilities guidelines" (De Boer, 14/03/2008: 5). The former Municipal manager agrees with this, insisting that the water quality standards at "Durban beaches are more advanced than the Blue Flag standards" (Sutcliffe, cited in De Boer, 14/03/2008: 5). Others disagree, contending that the standards are far less stringent than either Blue Flag (FEE, 2014) or the guidelines recommended by the WHO (2003) (Carnie, 06/08/2008).



Figure 3.3. Municipal signboard showing beach inspection under the Municipal Programme (27/10/2014)

eThekweni Municipality's return to the Blue Flag Programme

In 2010, following sustained political pressure from both national and provincial government (Mbanjwa, 14/04/2010), a sustained campaign by the Democratic Alliance (DA), and a change in the Municipality's management (Office of the City Manager, n.d) the eThekweni council unanimously resolved to re-join the BFP (Mather, email, 20/10/2014).

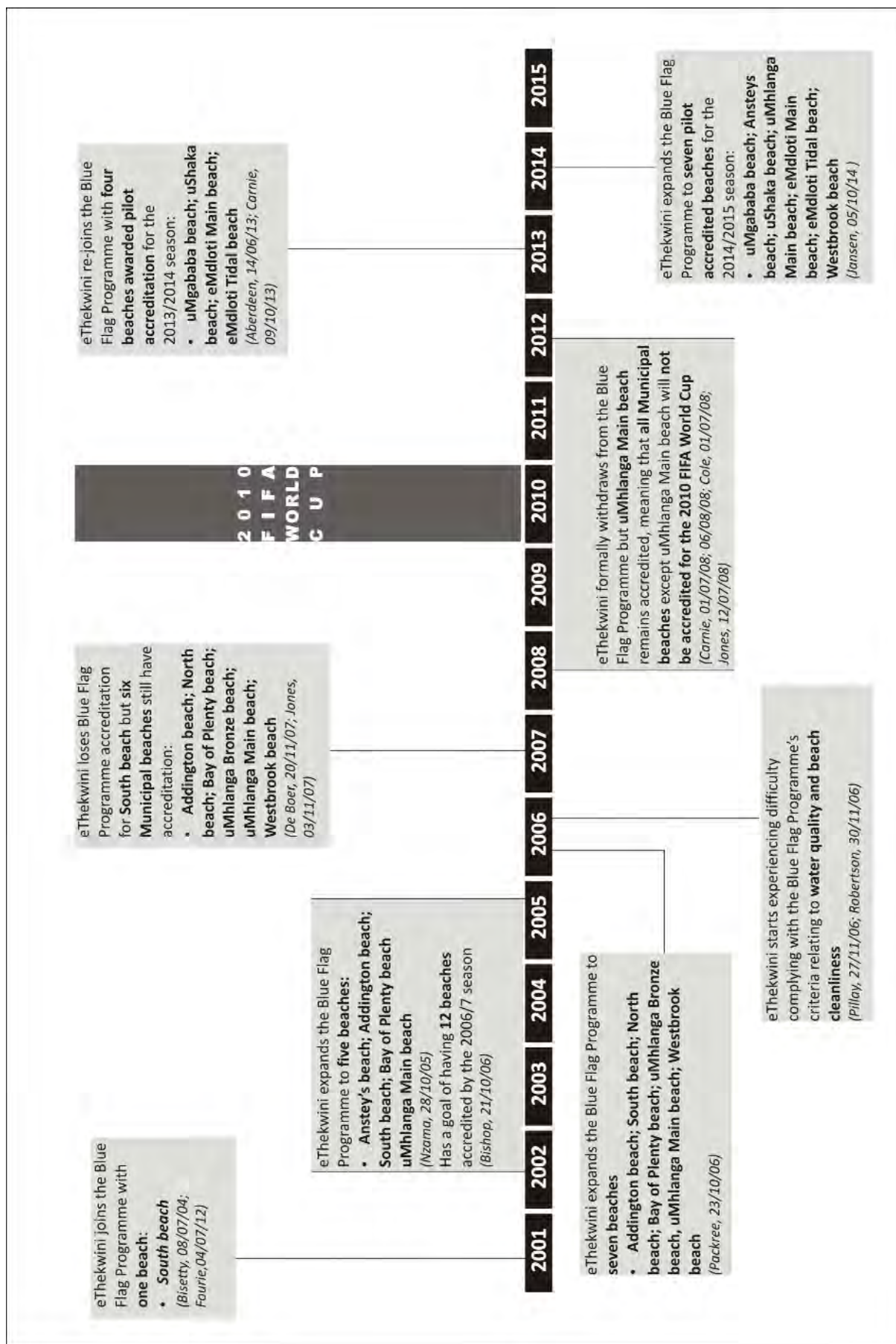


Figure 3.4. History of Durban's Blue Flag Programme experience

uShaka Beach, located between Addington Beach and the harbour wall (Fig.3.1), is the only beach on the 'Golden Mile' awarded BFP pilot status for the 2013/2014 season (Carnie, 09/10/13; Carnie & Wolhuter, 14/06/2013). Another three beaches within the Municipality's jurisdiction also have pilot status but they are located beyond the borders of the study area (Mbuyazi & Sanpath, 15/06/2013). They are: eMdloti Tidal Beach, eMdloti Main Beach, both located to the north of the 'Golden Mile', and uMgababa Beach, located to the south of the 'Golden Mile'. At the recent annual Blue Flag launch in Knysna, eThekweni was awarded BFP pilot status at three additional beaches, although none of these beaches are located on the 'Golden Mile' and notably the existing pilot beaches were not upgraded to full Blue Flag beaches (Jansen, 09/10/2014). These beaches are Westbrook Beach, uMhlanga Main Beach, both located north of the 'Golden Mile', and Anstey's Beach located south of the 'Golden Mile' (Jansen, 09/10/2014). There are plans to apply for pilot status for additional 'Golden Mile' beaches once there is enough data to illustrate compliance with the water quality criteria (Carnie, 09/10/13; Knowledge for Coastal Change Meeting 1, 12/03/2013).

The timeline in Figure 3.4 presents an illustrative summary of Durban's involvement with the BFP over the period 2002 to 2014.

The remainder of this chapter will focus on the regulatory and scientific context of water quality monitoring, since it is suggested that non-compliance with water quality criteria is the main reason for eThekweni's loss of accreditation and subsequent withdrawal from the BFP.

3.5 Water quality: the regulatory and scientific context

Beaches around the world, and in South Africa, are often used as recreational nodes by the public. Many recreational activities, such as swimming and bathing, diving, and surfing, are contact water-based activities (DEA, 2012). Coastal marine waters, as with terrestrial fresh waters, have the potential to harbour bacteria harmful to human health, commonly referred to as microbiological pathogens. Epidemiological studies suggest that there is a causal relationship between gastrointestinal illnesses in humans and exposure to microbiological pathogens. The main microbiological pathogens, faecal coliforms, that have been linked to human health risk are those commonly found in the digestive tract and faeces of mammals, including humans. *Escherichia Coli* (*E. Coli*) and intestinal *Enterococci* are used as indicators of known disease-causing faecal coliforms because they are generally found in the presence of

microbiological pathogens (DEA, 2012; Shibata *et al.*, 2004). Table 3.5 provides a definition of some of the terminology commonly used in the microbiological monitoring of water quality

Table 3.5. Definition of terminology commonly used in water quality testing (WHO, 2001, 2003)

Terminology	Definition
Microbiological indicators	Microbiological organisms (bacteria) that are used to detect and estimate the presence and level of faecal contamination in a water body. They are found in the presence of faecal bacteria and are easier to detect than faecal bacteria. Their presence indicates a possible health risk.
Coliforms	A broad class of gram-negative, rod-shaped bacteria found in the environment, and universally found in large numbers in the faeces of warm-blooded animals, including humans.
Bacteria	Microscopic living organisms.
Microbiological pathogens	A microbiological organism known to cause illness or disease.

Since beaches are major tourism attractions, potential generators of economic activity, and recreational nodes, the “pathogenic pollution of beach waters can have serious social and financial implications by having negative impacts on public health and the tourism industry” (Mardon & Stretch, 2004: 317).

The remainder of this section presents an overview of the international and local standards in marine water quality monitoring, by tracking and describing its historical developments. The marine water quality guidelines of the WHO, the EU and SA will be reviewed and briefly discussed.

3.5.1 The international context

Pathogenic pollutants enter urban marine and beach environments in a number of ways, most notably via the streams and rivers that drain a city’s catchment area, but also via the storm water drainage systems that keep the city from flooding. In order to keep users safe, marine and beach environments are monitored for microbiological indicators of known pathogens (Shibata *et al.*, 2004). That being said, there is some debate regarding which microbiological indicators to use because some of the coliforms found in marine waters are not only those originating from a faecal source (Shibata *et al.*, 2004). Additionally, spatial and temporal distribution and occurrence of microbiological organisms in a water body can potentially be

impacted by the physical qualities of a water body, such as temperature and salinity (CEC, 2006; DEA, 2012; Pruss, 1998; Shibata *et al.*, 2004; WHO, 2003).

In order to keep recreational water users safe, recreational water quality guidelines have been developed by global, regional, and national institutions, governments, and agencies to provide direction to local authorities tasked with water quality monitoring and maintenance (CEC, 2006; DEA, 2012; WHO, 2003). Collectively, these guidelines inform the Blue Flag criteria and South Africa's approach to water quality since the South African guidelines are based on an adaptive approach which has involved the review of a number of international guidelines, including the WHO and the EU, among others.

World Health Organisation (WHO) Guidelines for safe recreational water environments, Volume 1: Coastal and freshwaters

The WHO is the global health arm of the United Nations (UN) and aims to provide guidance on global health matters. It shapes the health research and development agenda, develops and sets norms and standards, provides policy directives, and facilitates technical assistance to countries (WHO, 2014). The intention of the WHO guidelines is to provide leadership “for the development of international and national approaches” for managing coastal recreational waters (DEA, 2012: B-5). The guidelines are broad since they are meant to be adapted to each national context based on local social, cultural, environmental, and economic characteristics.

Epidemiological studies conducted in the 1990s recommend intestinal *Enterococci* as the most appropriate microbiological indicator in marine (saline) waters because it survives longer in these conditions than other faecal coliforms, such as *E. Coli* (WHO, 2003). These studies have resulted in a set of conventional standards for measuring water quality. The concentration of intestinal *Enterococci* per sample is linked to an estimated health risk (Table 3.6), which shows that as the concentration of intestinal *Enterococci* in a water body increases (per 100ml), the risk of contracting respiratory and gastrointestinal illness also increases. In the worst case, exposure to a water body with a concentration of over 500cfu⁸ of intestinal *Enterococci* per 100ml results in a greater than 10% chance of gastrointestinal illness.

⁸ cfu is an abbreviation of colony forming units (of bacteria) and is a measure of the amount of live coliform bacteria present in a water sample.

Table 3.6. Guideline values for microbiological quality of recreational waters (WHO, 2003: 70)

95 th percentile value of intestinal <i>Enterococci</i> /100ml (rounded values)	Estimated risk per exposure
≤40cfu A	<1% GI illness risk <0.3% AFRI risk The upper 95 th percentile value of 40/100ml relates to an average probability of less than one case of gastroenteritis in every 100 exposures. The AFRI burden would be negligible.
41-200cfu B	1-5% GI illness risk 0.3-1.5% AFRI risk The upper 95 th percentile value of 200/100ml relates to an average probability of one case of gastroenteritis in 20 exposures. The AFRI illness rate at the upper value would be less than 19 per 1000 exposures, or less than approximately 1 in 50 exposures.
201-500cfu C	5-10% GI illness risk 1.9-3.9% AFRI risk This range of 95 th percentile represents a probability of 1 in 10 to 1 in 20 of gastroenteritis for a single exposure. Exposures in this category also suggest a risk of AFRI in the range of 19-39 per 1000 exposures, or a range of approximately 1 in 50 to 1 in 25 exposures.
>500cfu D	There is a greater than 10% chance of gastroenteritis per single exposure. The AFRI illness rate at the 95 th percentile point of >500/100ml would be greater than 39 per 1000 exposures, or greater than approximately 1 in 25 exposures.

AFRI = Acute febrile respiratory illness

GI = Gastrointestinal

LOAEL = Lowest-observed-adverse-effect-level

NOAEL = No-observed-adverse-effect-level

Exposure = Human exposure to water

Additional recommendations contained in the WHO (2003) guidelines relate to conducting ‘sanitary inspections’ of a beach with the aim of categorising beaches in terms of potential human health risk, based on an identification of sources, levels, and types of contaminants entering the marine water body. These guidelines also provide a recommended monitoring protocol in which the frequency of sampling increases as the potential health risk increases.

The WHO guidelines described in this section are broad and intended as general recommendations for the inclusion of certain water quality parameters in beach management programmes, and are therefore “not prescriptive in terms of the analytical techniques to be applied” (DEA, 2012: B-9).

European Union (EU) bathing directive 2006/7/EC

In the EU, the Council of the European Community Directive 2006/7/EEC governs water quality guidelines and bathing water quality management for all EU member states (CEC, 2006). The purpose of the directive is to strengthen microbiological standards for European beaches to ensure that they meet minimum health and environmental requirements to guarantee the safety of beach users (DEA, 2012). Additionally, the directive aims to harmonise the beach management approaches of EU member states and to more effectively provide the public with better information on water quality (Mourato *et al.*, 2003). In addition to intestinal *Enterococci*, coastal authorities are also required to monitor marine water bodies for *E. Coli* (CEC, 2006). The directive prescribes limits for these two microbiological indicators, illustrated in Table 3.7, which shows that an ‘excellent’ bathing area is one with an intestinal *Enterococci* concentration of less than 100cfu/ 100ml or an *E. Coli* concentration of less than 250cfu/ 100ml.

Table 3.7. Microbiological limits for EU coastal and transitional waters (CEC, 2006: 46)

Parameter	Excellent	Good	Sufficient
Intestinal <i>Enterococci</i> (cfu/ 100ml)	100*	200*	185**
<i>E. Coli</i> (cfu/100ml)	250*	500*	500**

*Based on a 95th percentile evaluation

**Based on a 90th percentile evaluation

Under the directive, bathing water quality is rated on the basis of microbiological testing results and a periodic review of the bathing water profile. Bathing water profiles provide descriptive accounts of the physical and hydrological conditions of a specified bathing area, and assessments of potential impacts or threats to water quality (EEA, 2014).

The limits for intestinal *Enterococci* are aligned with those recommended by the WHO (2003) although there are fewer categories of health risk. The limits are based on the 95th percentile. What this means for water quality testing is that this is the percentage of samples that must be within the specified limit, i.e. 9.5 samples in every ten must be within the limit of 100cfu / 100ml in order for an ‘excellent’ grading.

The directive also provides guidelines on the methodology to be employed by coastal authorities within the regional bloc, unlike the WHO (2003) guidelines. Additionally, monitoring protocols observable by all EU member states for the duration of their respective bathing season are prescribed, with a stipulated minimum of four samples per bathing season (CEC, 2006; DEA, 2012). They also provide insight into the preferred analytical methods to

be employed during monitoring as well as the maximum allowable period in between monitoring, and the measures to be taken in the event of temporary pollution (CEC, 2006).

The water quality guidelines of the WHO and the EU informed the development of the SA guidelines and there is therefore a strong link between the three sets of guidelines in terms of applicable microbiological criteria for marine water quality.

3.5.2 Monitoring marine water quality in South Africa

Historically in South Africa, marine water quality was managed on an individual or in a haphazard manner “which did not ... take into account possible cumulative or synergistic effects as a result of multiple activities or developments within a specific area” (Taljaard *et al.*, 2007: 535). There was no conformity in approach, with water quality managed on a beach-by-beach basis. This was because no comprehensive management guide or policy existed for all of South Africa’s beaches (Glavovic, 2006b; Taljaard *et al.*, 2007).

Until 1984, there were no water quality guidelines for the coastal zone in South Africa. The process of developing guidelines was initiated in 1983 by the South African Network for Coastal and Oceanographic Research (SANCOR), with the first guidelines officially published in 1984 (DEA, 2012). These guidelines were reviewed by the Water Research Commission (WRC) of South Africa in 1992, resulting in an interim report titled *South African Water Quality Guidelines for the South African Coastal Zone* (DEA, 2012). This followed two days of deliberation amongst scientists, engineers, national and local authorities, environmental organisations, and industry.

The development of the guidelines progressed further under the Department of Water Affairs and Forestry (DWAF), which, in 1995, began updating the guidelines for fresh and marine waters, culminating in the publication of the *South African Water Quality Guidelines for Coastal Marine Waters Volume 2: Recreational Use* (DWAF, 1995). It should be noted that not much changed between the 1992 and 1995 versions of the guidelines, and the microbiological indicators are the same in each document (DEA, 2012). The remainder of this section reviews the South African current guidelines.

Management of coastal systems is aimed at ensuring that the resource is safe for all designated uses (DEA, 2012). The South African marine recreational water quality guidelines have been developed with this in mind, and distinguish between contact and non-contact recreation activities. Contact recreation includes activities such as swimming, diving, and surfing, while non-contact recreation includes activities in the coastal zone such as camping, sightseeing, and hiking (DEA, 2012). Table 3.8 isolates criteria considered as important constituents of beach water quality.

Table 3.8. Key water quality properties/ constituents used to assess different problem categories associated with recreational use of coastal marine waters (DEA, 2012: 10)

Property/ constituent	Problem category		
	Aesthetics	Human health & safety	Mechanical interference
Objectionable matter	x	x	x
Microbiological indicator organisms		x	
Physio-chemical parameters (pH & temperature)		x	
Toxic substances (chemical compounds & non-toxic algal blooms)		x	

This table shows that microbiological indicator organisms, physio-chemical parameters, and toxic substances are of concern only for human health and safety, while objectionable matter impacts on aesthetics, human health and safety, and could result in mechanical interference.

The guidelines also provide target values for each of these identified problem categories but since the research is concerned primarily with microbiological indicators, a main focal area of the BFP, only the microbiological parameters and target values are presented below in Table 3.9. The table shows that an 'excellent' water quality sample is one that has an *Enterococci* concentration of less than 100cfu/ 100ml and less than 250cfu/ 100ml of *E. Coli*. These limits are aligned with both the WHO guidelines and the EU guidelines and are also based on the 95th percentile.

Table 3.9. Microbiological limits recommended for South African coastal marine recreation waters (DEA, 2012: 13)

Category	<i>Enterococci</i> (count per 100 ml)	<i>E. Coli</i> (count per 100 ml)
Excellent	≤ 100 (95 th percentile)	≤ 250 (95 th percentile)
Good	≤ 200 (95 th percentile)	≤ 500 (95 th percentile)
Sufficient or fair (minimum requirement)	≤ 185 (95 th percentile)	≤ 500 (95 th percentile)
Poor (unacceptable)	> 185 (9 th percentile)	> 500 (90 th percentile)

The monitoring protocol recommended in these guidelines is concerned mainly with identification of microbiological indicators because these are deemed to be of critical importance in preventing illness in contact recreation users. This is because the physio-chemical properties of marine waters are unlikely to be altered by unnatural processes or sources beyond what is considered acceptable, due the strong buffering ability of sea water. Additionally microbiological contamination of coastal recreational waters is considered to pose a greater health risk to users than toxic contamination (DEA, 2012).

It is recommended that monitoring of water quality by sampling and analysing its microbiological content should occur in periods when the beach is used for contact recreation and that sampling should happen fortnightly, irrespective of weather conditions (DEA, 2012). Specific analytic methods are prescribed in the South African guidelines. These are particularly relevant since it is suggested that part of the reason eThekweni's water quality appeared so poor under the BFP standards relates to the analytic methods employed by the municipality (Knowledge for Coastal Change Meeting 1, 12/03/2013). The methodology is highly prescriptive and even includes recommendations on elements such as sampling depth, timeframes within which samples should be processed, and approved methods to be employed (DEA, 2012). A critical requirement is that samples must be processed and analysed by a "reputable (preferably an ISO 17025 accredited) laboratory" (DEA, 2012: 16) and that procedures followed should be an approved South African National Standards (SANS) (Table 3.10).

Table 3.10 indicates the prescribed testing methodology for the two main microbiological indicators: intestinal *Enterococci* and *E. Coli*. These methods are accredited by both the South African Bureau of Standards (SABS) and the International Organisation for Standardisation (ISO) and are aligned with the SANS. There are two approved methodologies for each indicator: the miniaturised method (most probable number) and the membrane filtration

method. Preparation of the miniaturised method (most probable number) is time-consuming, and the calculation of results challenging. This method requires dilution and incubation of water samples across a number of tubes and then an estimation of the most probable number of coliforms, derived using a conversion chart based on a statistical formula. The miniaturised method shows only the presence of an approximate number of microbiological organisms (Bux, email, 03/09/2014; WHO, 2001). The membrane filtration method is easier to prepare and simpler to use. Here the water sample is poured through a membrane filter that is then placed on a lactose-enriched liquid petri dish. This method is useful at identifying and counting specific colonies of microorganisms, such as *E. Coli* and intestinal *Enterococci* (Bux, email, 03/09/2014; WHO, 2001).

Table 3.10. SANS analytical methods for the different microbiological parameters (DEA, 2012: 16)

Parameter	Method/s
Intestinal <i>Enterococci</i>	SANS/ISO 7899-1: 1998 Water Quality – Detection and enumeration of intestinal <i>Enterococci</i> . Part 1: Miniaturised method (Most Probable Number) for surface waters (www.sabs.co.za) SANS/ ISO 7899-2: 1998 Water Quality – Detection and enumeration of intestinal <i>Enterococci</i> . Part 2: Membrane filtration method (www.sabs.co.za)
<i>Escherichia Coli</i>	SANS/ ISO 9308-3: 1998 Water Quality- Detection and enumeration of <i>E. Coli</i> and total coliform bacteria. Part 3: Miniaturised method (Most Probable Number) for the detection and enumeration of <i>E. Coli</i> in surface waste waters (www.sabs.co.za) SANS/ ISO 9308-1: 1998 Water Quality- Detection and enumeration of <i>Escherichia coli</i> coliform bacteria. Part 1: Membrane filtration method (www.sabs.co.za)

The SA guidelines adopt international best practice with regards to the management of marine water quality. Research has been conducted into the development of an implementation framework for ICM and marine water quality management in South Africa and this has fed into the development of the guidelines, which are applicable to all South African beaches used for recreation (see for example Taljaard *et al.*, 2007; Taljaard, 2011; Taljaard *et al.*, 2012). It should be noted that the guidelines are not mandatory but rather serve as a benchmark against which it is suggested all coastal authorities should aspire.

3.6 Conclusion

This chapter provides a background for the research in order to situate it within a physical, economic and regulatory context.

The sub-tropical climate of eThekweni coupled with the proximity of the ‘Golden Mile’ to the city of Durban, makes Durban a year-round tourist attraction. To harness this economic potential, the beaches and coastal zone need effective management.

South Africa has legislated the ICM approach which is currently the dominant global paradigm in coastal management. This is an integrated and holistic approach that includes a range of stakeholders as well as multiple governmental departments in decision-making processes. It is a requirement of the ICM Act (RSA, 2008) that all three governmental spheres develop their own coastal management programmes (CMPs). To this end, the recently published NCMP (DEA, 2014) gives policy directives to provinces and municipalities to assist in development of their respective CMPs.

The BFP can be likened to a CMP. eThekweni, in 2001, was the first coastal municipality not in Europe to join the programme. However, controversy around the Municipality’s involvement in the BFP peaked between 2006 and 2008 when the Municipality found itself unable to comply with water quality criteria, culminating in a withdrawal from the programme. Scientific advisors to the municipal manager justified this decision by citing concerns regarding the suitability of *E. Coli* and intestinal *Enterococci* as microbiological indicators of water quality for a subtropical climate where warmer waters can promote their growth and aid distribution. Public dissatisfaction with the withdrawal was widely publicised in the media, particularly since this meant there would be no accredited beaches in Durban over the 2010 FIFA World Cup.

The Municipal Programme subsequently instituted by the Water and Sanitation Department led to a fall out between the Municipality and WESSA, the coordinator of the BFP in South Africa, and was regarded as ‘political spin’ by professional and civil society alike. Sustained political pressure was brought to bear on the Municipality, from both provincial and national government and the Municipality re-joined the programme in 2010. Proactive intervention to

improve faecal contamination of sea water quality led to pilot status being awarded to four beaches in the 2013/ 2014 season (Fig.3.4).

The following chapter will present the methodological approach employed in this study, including data collection techniques, sampling method, and the analytical process. It will also highlight some of the constraints the researcher encountered during the research process.

CHAPTER 4

RESEARCH METHODS AND METHODOLOGY

4.1 Introduction

The aim of this research is to understand the contestation over eThekweni Municipality's changing policies for monitoring and management of beach water quality and the underlying knowledge upon which these policies are based. A qualitative research method has been adopted. The methodology employed is framed within the constructivist and hermeneutic tradition which argues that reality is socially constructed and therefore meaning can only be grasped through interpretative understanding (Kitchin & Tate, 2000; Lincoln *et al.*, 2011; Mottier, 2005; Patton, 2002). Research within the hermeneutic tradition is intensive and seeks to understand the layers of meaning via a qualitative methodology (Patton, 2002).

With regards to the history of the BFP in Durban (2002 to 2014), discourse analysis, coupled with thematic analysis was used to interpret both the perceptions and the experiences of individuals, in relation to the adoption of this beach water quality management policy (Kitchin & Tate, 2000a; Hajer & Versteeg, 2005a; Hajer & Wagenaar, 2003). This included people involved in, familiar with, or impacted by, the processes of decision-making that informed the sea water quality management and monitoring policies adopted by eThekweni Municipality. Decisions regarding eThekweni's involvement with the BFP took place between 2008 and 2012 and therefore direct observation of meetings and deliberations was not possible as a tool for this research. Participants in the study included those people who had been involved, either directly or indirectly, or had been vocal about the outcomes of these policy deliberations. This includes: municipal officials and managers, politicians, scientists and environmental professionals, beach users, and newspaper journalists. Newspaper articles constituted a further valuable data source as they provided a historical insight into public perceptions and the politics surrounding of Durban's Blue Flag experience over the study period.

Secondary data comprised literature in the form of books, journal articles, policy documents, and legislation relevant to the study area. This literature served to inform the theoretical framework for the study, as well as to establish the context within which the study was conducted.

The methodology employed in this study is described in this chapter. Section 4.2 defines the primary and secondary data sources. This is followed by a description of the requisite data collection process for each of these in sections 4.3. Section 4.4 outlines the sampling techniques employed in this study, while section 4.5 discusses the data analysis and interpretation methods applied. Section 4.6 focuses on the limitations of the research encountered by the researcher, and finally, section 4.7 concludes the chapter.

4.2 Primary and secondary data sources

Primary and secondary data sources were employed in the research. Primary data sources are defined by Kitchin and Tate (2000: 226) as, “materials that have been recorded by those who actually witnessed an event ... [and as] represent[ing] knowledge by acquaintance”. Primary data was collected in order to understand eThekweni’s history with the BFP. Oral and documentary data sources are the two main primary data sources gathered for this study. The views and understandings held by politicians, scientists, beach users, and managers were gathered in order to understand how eThekweni’s involvement with the BFP was contested from 2002 to 2014, with this intensifying in 2008.

Kitchin & Tate (2000: 226) define secondary data sources as referring to “materials recorded after the event from second parties”, who did not experience the event. Additionally, secondary sources consist of ‘raw data’ that has already been analysed. The secondary sources utilised in this study comprised literature in the form of books and journal articles relating to bodies of theory framing the research. This literature can be categorised into four core bodies of theory: the first relates to the new social order, governance, and the knowledge society; the second to the (changing) relationship between science and society within the ‘network society’; the third to a typology of knowledge; and the fourth to discursive knowledge in the form of discourses and ecolabels.

4.3 Data collection

Primary data was collected from four main sources: interviews; newspaper articles; policy and statutory documents; and photographs, and these are now presented.

4.3.1 Interviews

Semi-structured, open-ended interviews were conducted with individuals deemed by the researcher to be knowledgeable about Durban and its history with the BFP, or who were involved in any way with the BFP in the city around the time of its abandonment in 2008. Data obtained from these interviews formed one of two major source of primary data which constituted the empirical evidence for the research. The open-ended structure of this technique of interviewing facilitates the capturing of views, opinions and attitudes often not readily observable, and which might be omitted in a closed interview process, where, for data collection purposes, answers must fit into predetermined categories (Berg, 2009; Kitchin & Tate, 2000; Patton, 2002). Furthermore, the semi-structured approach “permit[s] comparisons across interviews” (Berg, 2009: 109). This interview technique was chosen specifically to address the objectives of the study.

The researcher conducted 17 interviews with participants between the months of September and November 2014. Each interview took approximately one hour and was conducted at a time and venue convenient to the participant. In most instances this meant that the interview was held at the participants’ work place in order to minimise absence from work and disruption to their day (Table 4.1). Participants who were interviewed but did not give permission for their names to be used are listed as Respondent A, B, C and D.

Table 4.1. Scheduling of interviews

Participant	Affiliation (Organisation/ job title)	Date
Paul Jones	Surfer (Urban-Econ: Senior Development Economist)	23/09/14
Dr Andrew Mather	eThekweni Municipality Project Executive: Coastal Policy	30/09/14
Mike Larmont	Surfer (Owner of Larmont Surf shop)	30/09/14
Tony Carnie	Independent newspapers: Journalist	01/10/14
Geoff Pullan	DA eThekweni Councillor	03/10/14
Clint Chrystal	eThekweni Municipality: Coastal Engineering, Storm water and Catchment Management	07/10/14
Respondent A	CSIR	09/10/14
Respondent B	eThekweni Municipality	09/10/14
Respondent C	CSIR	09/10/14
Tandi Breetzke	Royal Haskoning DHV: Leading Professional: Coastal Management	13/10/14
Siobhan Jackson	eThekweni Municipality: Water & Sanitation	16/10/14
Respondent D	KZN Department of Economic Development, Tourism & Environmental Affairs	17/10/14

Participant	Affiliation (Organisation/ job title)	Date
Sheivine Datadin	WESSA: National Coastal Programme Assistant (Blue Flag)	17/10/14
Dr Sean Fennessey	ORI: Senior scientist	23/10/14
Steven Weerts	CSIR: Senior scientist, Coastal Systems Research Group	28/10/14
Alison Kelly	Former SA Blue Flag coordinator	01/11/14
Dr Michael Sutcliffe	City Insight (former eThekweni Municipal manager)	03/11/14

In two instances, it was difficult to arrange interviews with potential participants despite both agreeing to an interview in principle, via email. Subsequent follow up from the researcher, via both email and telephone, did not elicit a response and these two interviews were not conducted. This was unfortunate since one potential participant was a ward councillor and the politically embedded knowledge held by this individual would have potentially contributed towards a deeper understanding of the political perspective around the BFP and its ‘buy-in’ (or lack thereof).

Initial contact with all proposed participants was made telephonically, in order to briefly clarify the intention of the subsequent interview. Where telephonic contact was not possible, participants were contacted by email only. All initial contact was then followed up with a formal email request for an interview.

To facilitate the capturing of views and opinions, a semi-structured and open-ended style interview was deemed appropriate for identifying the meanings and views of the participant. An interview schedule (Appendix B) was designed to ensure that all participants were asked a similar set of questions. The interview schedule was structured in order to answer the research objectives. This provided some direction and structure for the dialogue. Since most of the questions were open-ended there was a degree of flexibility within the schedule which meant that participants’ answers were not limited to a predefined agenda of questions, thus enabling a more holistic understanding of their responses. Patton (2002: 343) suggests that,

“... an interview guideline is prepared in order to ensure that the same basic lines of enquiry are pursued with each person interviewed. The interview guide provides topics or subject areas within which the interviewer is free to explore, probe, and ask questions that will elucidate and illuminate a particular subject”.

In the first section of the interview schedule participants were asked a basic set of questions regarding their positions and knowledge. This line of questioning enabled personal profile development for each participant while also allowing the researcher to gauge the extent of his/her Blue Flag knowledge, or competence. Participants were subsequently grouped in accordance with the knowledge typology presented in Chapter Two, namely, tacit, embedded (professional and political), and codified. This resulted in the three main groups of knowledge holders being interviewed (Table 4.2).

Table 4.2. Table illustrating Participant grouping and composition

Knowledge type	Group composition
Tacit knowledge holders	Beach users (surfers)
Embedded knowledge holders	Municipal officials, Blue Flag SA officials, newspaper journalists, councillor
Codified knowledge holders	Scientists

The interview schedule comprised three sections, focusing on the following topics: extent of beach use; perceptions of the ‘Golden Mile’; and Blue Flag and coastal management knowledge. Additional topics were specifically targeted at each of the groups presented in Table 4.2 and included: beach water quality monitoring; the political context of the BFP in Durban; and any factors that may have influenced a change in approach to beach management within the Municipality. This was done in order to capture specific knowledge potentially held by participants in each group.

Two of the interview schedules were targeted at specific participants, namely, the former Municipal Manager, Michael Sutcliffe, and the former coordinator of the South African Blue Flag, Alison Kelly. Both were anticipated to hold intimate knowledge of the BFP and were considered to be key informants for the research (Appendix C and Appendix D).

Participants were provided with an informed consent form that explicitly detailed the ethical considerations involved in participating in the study, particularly those concerning anonymity and voluntary participation. This form was read to all participants and also served as an additional standardised introduction. At this point all participants were asked about their preferences regarding anonymity and four participants requested their names and official job positions to be withheld. Permission was requested to voice-record the interviews for analysis.

All but two participants agreed. Notes were also made by the researcher during the interviews in order to enable subsequent cross-referencing with the audio recordings.

4.3.2 Newspaper articles

Newspaper articles and press releases comprise the main sources of documentary data for this study, and extensive use was made of these data sources. Newspaper articles and press releases provide public access to information, as well as insight into public perspectives in the case of letters written to the editors of newspapers. They are therefore important in helping to reveal a timeline of events, in order to better identify and understand the environmental politics surrounding eThekwin's BFP. Two main digital databases were utilised: Sabinet, and the Independent Newspapers' internal database. All newspapers with a Durban-based readership, namely, The Daily News, The Mercury, The Natal Witness, The Independent on Saturday, the Saturday Star, The Sunday Tribune, and The Sunday Times, were searched for any articles, including letters to the editor, which were written between 2004 and 2014, and which mentioned 'Blue Flag' and 'Durban'. This yielded approximately 175 articles, of which 44 were discarded because on closer inspection they were either not relevant or were duplicated in the two databases. The Mail and Guardian was a notable exception to the list of newspapers accessed, because the researcher did not have a subscription to this newspaper and could not access its archival database.

4.3.3 Policy and statutory documents

Policy documents in the form of water quality guidelines, and statutes that were relevant to the South African coastal environment, provided background information that informed the context of the study.

4.3.4 Photographs

Photographic evidence contextualised the study site by providing a graphic or pictorial account of what coastal governance and beach water quality management look like 'on the ground' (Fig. 3.3).

4.4 Sampling

A total of 19 potential participants were identified and contacted to participate in this study, with two declining to participate. A purposive sampling method was employed, which meant that participants were selected as they served the purpose of the study (Tongco, 2007). Because this study was concerned only with the BFP and its history in Durban, it was essential to select those individuals who held applicable Blue Flag knowledge. While purposive sampling has been critiqued as having limitations regarding generalisation, this is not problematic in this study since generalisation is required in positivist research and this is not the goal of this research (Tongco, 2007). Purposive sampling was therefore deemed to be an appropriate sampling technique, because it enabled the researcher to identify specific individuals with potentially relevant knowledge (Berg, 2009). Purposive sampling allows the researcher to identify and select "information-rich cases for study in depth", since "the logic and power of purposeful sampling derive from the emphasis on in-depth understanding" (Patton, 2002: 46). In other words, this sampling technique enables the researcher to identify and select specific potential participants, based on their assumed ability to provide knowledge and contribute towards the research.

A valuable source of information for purposefully identifying potential participants was the 'Letters to the Editors' page found in newspapers. At least two participants were identified due to their frequent submission of letters to newspaper editors. Once the main participants had been identified, a snowball sampling technique was used to identify other potentially knowledgeable individuals. This was done by asking participants if they knew of anyone else who might also hold useful knowledge on the subject, and be willing to share this in an interview (Patton, 2002). The purpose of snowball sampling is to ask informants to suggest other potential informants (Tongco, 2007). By adopting these two sampling techniques it was possible to make contact with a number of knowledge holders. This included people who were either involved in the policy-making processes in some way, or were vocal about the outcomes of the said processes, or who used the 'Golden Mile' beaches and were therefore potentially impacted by the policy-making.

4.5 Data analysis and interpretation

In this thesis an interpretative approach was utilised. An interpretative and deductive approach to research entails considering "the social world ... as a subjectively lived construct" (Mottier,

2005: 3), in which meaning can only be understood through interpretation. The research draws on literature which informs the interpretative methodology used in the research (Callon, 1999; Castells, 2005; Dryzek, 2005; Hajer, 2005, 2006; Griggs, 2000; Kitchin & Tate, 2000; Mottier, 2005; Whatmore. 2009).

Discourse analysis is an appropriate method for identifying and analysing environmental discourses within the field of environmental policy-making through examining the language used by an actor to persuade those with differing views (Hajer & Versteeg, 2005b). The deliberative process surrounding Durban's adoption of the BFP is presented as a case study of the environmental politics of beach water quality policy-making. Before commencing with the discourse analysis, a thematic analysis was undertaken in order to interpret and analyse the raw primary data. This section presents a descriptive account of both the thematic and discourse analyses.

4.5.1 Thematic analysis

There are multiple ways in which qualitative data can be analysed thematically (Braun & Clarke, 2006). Dey's (1993) 'omelette approach' requires the researcher to identify patterns and relationships within the data. This approach was selected because it is prescriptive and offers a step-by-step guide as to how the interpretation of themes can be accomplished within qualitative research. The concern is with categorising data and identifying or establishing connections between these categories (Dey, 1993), and is similar to other thematic techniques that seek to systematically work through and analyse raw primary data (Braun & Clarke, 2006). Moreover, it is based on the assumption that interpretation and analysis of data is a subjective process and therefore the researcher's positionality is expected to play a role (Kitchin & Tate, 2000). A central assumption of this approach is that interpretation and analysis of data is only possible by first 'breaking it up' and then 'putting it back together' again (Dey, 1993). This section describes the steps followed in interpreting the primary data.

According to Dey (1993: 31), "the core of qualitative analysis lies in these related processes of describing phenomena, classifying it, and seeing how ... concepts interconnect". These three stages in interpretation and analysis are briefly described.

The descriptive stage of data interpretation and analysis aims to “develop thorough and comprehensive descriptions of the phenomenon under study” (Dey, 1993: 32). In describing the situational context, the researcher provides a ‘thick’ description of the context within which the activity took place. This includes the spatial, temporal, and social context. It is important to provide a thorough situational context, because “contexts ... [are] key to meaning, since meaning can be conveyed ‘correctly’ only if [the] context is also understood” (Dey, 1993). Kitchin and Tate (2000: 233) agree on the potential for context to impact data findings, suggesting that, “it is well known that the social, spatial and temporal context can all significantly affect the data generated”.

Classification of meaning into categories (or themes) is the first step towards interpreting data obtained in research, in an attempt to make it understandable, both to the researcher and to others, since “without classifying the data, we have no way of knowing what it is that we are analysing” (Dey, 1993: 41). Classification of data is the ‘breaking it up’ stage of the ‘omelette’ analogy and is “a process of drawing distinctions within the data” (Dey, 1993: 139). It is referred to as the ‘splitting’ phase of the analytic process. Once ‘broken up’, data can then be systematically categorised or grouped, allowing for more effective capturing of individual participants’ answers (Dey, 1993; Kitchin & Tate, 2000). This stage of the analytic process is largely dependent on the researcher’s ability to interpret meaning. In this research, categories and sub-categories evident in the data will help the researcher to answer the questions, with strong backward and forward linkages. This is because the categories of meaning are co-produced in the interview during the engagement between the researcher and the participant, and will therefore align with the objectives.

The next step in the ‘omelette approach’ to interpretative analysis involves “identification and understanding of the relationships and associations between different classes” (Kitchin & Tate, 2000: 235). This is the point at which the data is ‘put back together again’ to create a pattern of meaning and is also termed ‘splicing’ (Dey, 1993). This final step in the process renders classified data more readily accessible, enabling the researcher to begin answering the aim and objectives of the study.

In order to interpret and understand the data gathered for this study a thematic technique was used, whereby participants’ answers were systematically ‘split’ and sorted into separate categories. Each category constituted a master theme which was informed by, and derived

from, the objectives of the research. The interviews were structured in order to collect data in a systematic manner, so that it could be easily ‘split’ and ‘categorised, while also enabling the interviews to ‘flow’. The interview schedule was therefore systematically designed in relation to the objectives of the research.

An important first step in guiding the analysis, was to establish four separate categories, each focusing on addressing and satisfying one of the objectives. This is how the master themes for analysis were derived. Table 4.3, below, shows the derivation of master themes from the research objectives, into which all interview data was ‘split’.

Table 4.3. Table showing master themes derivation from objectives

Objective	Master theme
1. Explore the understandings of water quality held by a wide range of knowledge holders	Discourses used to understand and interpret sea water quality
2. Explore the knowledge that forms the basis of the two different water quality management approaches employed by the municipality, and understand how this knowledge is used	Discourses used to understand and interpret water quality knowledge
3. Explore the role played by politics in relation to the adoption of these different management approaches within eThekweni	The political contestation of water quality management in eThekweni
4. Assess which of Callon's (1999) three models of knowledge production is most applicable to each of the water quality management approaches adopted by eThekweni	Knowledge production and contestation through informal participation and engagement

The first two master themes aid interpretation and understanding of the knowledge of water quality, as expressed by participants, while the latter two master themes relate to the political dimension of water quality management, and to the contestation of water quality knowledge in the local eThekweni context. It was through this process of derivation that it became possible to begin to summarise participants’ answers, and to form an understanding of what was said, while also exploring possible connections between separate answers.

Once the master themes had been derived and the data ‘split’ and sorted into separate categories, data was then further ‘split’ and refined into sub-themes, based on patterns that became evident in each category. When performing a thematic analysis, it is necessary to consider both the internal homogeneity and external heterogeneity of the master themes, and their respective sub-themes (Braun & Clarke, 2006). This ensures that derived categories or

themes accurately capture and reflect the meaning suggested in the primary data, and that the categories are distinct enough to limit, or eliminate, any overlaps between sub-themes (insert ref).

The final step in the ‘omelette approach’, referred to by Dey (1993) as ‘splicing’, is concerned with understanding connections between different categories (themes), and also between individual participant’s answers. This is the stage at which data is ‘put back together’, and was a critical interpretative step enabling identification of dominant environmental discourses held by interview participants. Discourse identification required creativity and intellect on the part of the researcher, because identifying environmental discourses is challenging as a result of there being no “well-defined boxes” within which to classify environmental issues (Dryzek, 2005: 8). Additionally, because discourses represent personal ways of apprehending or perceiving the world, there is potential for a wide variety of discourses held by participants (Dryzek, 2005). Identifying discourses is a subjective task influenced by the researcher’s own positionality. All themes and sub-themes emerging in the primary data are treated as discourses, and are discussed in-depth in Chapter Five, and Chapter Six. How each research objective was satisfied is now presented.

4.5.2 Discourse analysis

Discourse analysis differs from thematic analysis in the manner in which it examines language as a means for uncovering meaning. In this research discourse analysis was the primary analytic method employed as it enabled an in-depth analysis of the views and opinions of participants regarding the BFP in Durban. A crucial assumption of this analytical method is that individual perspectives are fundamentally influenced by language which plays a pivotal role in deliberative policy-making as actors use language to argue for their particular viewpoint’s inclusion in policy-making processes (Hajer & Versteeg, 2005a). Thematic analysis, while useful for identifying patterns in language, falls short of this, and is therefore limited in its interpretive capabilities.

Objectives 1 and 2 are concerned with exploring and understanding both the type and extent of knowledge held by participants, with regards to water quality generally, and their understanding of how this knowledge is utilised in the management of Durban’s beaches. In order to satisfy Objective 1, each participant’s answers regarding knowledge of sea water

quality were classified according to the type of knowledge held, based on the knowledge typology discussed in section 2.5. These knowledge types are: tacit; embedded (professional and political); and codified (Gibbons *et al.*, 1994). Patterns were identified in participants' answers, and this resulted in the emergence of dominant water quality discourses. It was generally true that knowledge holders expressed their understanding of water quality by employing (and constructing) a wide range of different discourses, although there were instances when they used a combination of knowledge types. Tacit discourses of water quality were based on visual and olfactory cues, as well as on health and illness. Embedded and codified discourses, which were often combined with tacit knowledge, tended to express water quality in terms of microbiological and ecological characteristics. Following from this, knowledge of the BFP, and the alternative Municipal Programme of water quality management, was assessed and supplemented with primary data obtained from newspapers. This made satisfaction of Objective 2 possible. The discussion around the first two objectives is found in sections 5.2 and 5.3 respectively.

Objectives 3 and 4 are both concerned with exploring and assessing the political dimension of the deliberative processes that resulted in the political contestation of the BFP in Durban. Discourse analysis is an appropriate tool for analysing and assessing the ways in which environmental phenomena are understood (Dryzek, 2005; Hajer, 2005), such as the environmental policy-making around beach water quality management in Durban. During interviews, specific questions were designed and included in the interview schedule in order to elicit the necessary information. For example, questions were asked with the intention of satisfying Objectives 3 and 4, regarding participants' knowledge of the debate surrounding the BFP in Durban, the reasons for losing accreditation, competing management ideologies, and how the situation has changed over the past decade.

There were a number of dominant discourses identified during analysis of the interviews, with each presenting an argument related to water quality and beach management and therefore a shift in the engagement between the Municipality, Blue Flag SA, and the public. By taking a holistic view of all the discourses, and also the data obtained from newspaper articles, it was possible to assess the power of each discourse in the deliberative process. Additionally, it was also possible to identify the 'discourse coalitions' that were formed among stakeholders in order to argue for or against a particular management approach. This satisfied Objectives 3 and 4, the discussion around which is found in sections 6.3 and 6.4 in Chapter Five.

4.6 Limitations and considerations to the research

Limitations and considerations in the research included: ethical considerations, the positionality of the researcher, and a time constraint for one of the interviewees. At this point it would be remiss not to mention the composition of the group of participants, which was skewed in the direction of white males. All of these factors could potentially impact on the primary data collected, and therefore it is to these potential impacts that the discussion now turns.

4.6.1 Ethical considerations

When employing a qualitative methodology, it is essential that the ethical obligations of the researcher are considered (Patton, 2002). Information provided by participants in a qualitative study can potentially be conflicting, especially in an emotive issue, such as the BFP in Durban. It is therefore necessary to protect the identities of certain participants to prevent any detrimental consequences or impacts on their reputations, as a result of the publication of this research (Patton, 2002). Fortunately in this research, only four of the 17 interviewed participants, or approximately a quarter, requested anonymity, with the rest providing permission for their names to be used, when referring to anything they had said. Anonymous participants have been referred to as: Respondent A; Respondent B; Respondent C; and Respondent D. This is considered a limitation because knowing exactly who the respondent is makes the evidence supplied by them more immediate as opposed to a more distant anonymous person.

4.6.2 Positionality

The hermeneutic tradition assumes that objectivity of the researcher is impossible (Mottier, 2005). Analysis and interpretation of findings is a subjective process, and the positionality of the researcher is therefore a critical consideration, because it has the potential to influence the manner in which the research process unfolds, as well as how data is analysed. Positionality of the researcher refers to the inherent prejudices, understandings, and preconceptions of the researcher, which make him who he is, and dictates how he will interpret and understand the findings (Mottier, 2005). Explicitly stating the positionality of the researcher allows any prejudices to have a positive role in the research (Mottier, 2005). In this research, the data collected is assumed as a product of co-production between each participant and the researcher. The positionality of the researcher is therefore a critical component of data collection process.

In some instances, participants felt more comfortable during the interview when they had enjoyed a pre-existing personal, academic, or business relationship with me. The presence of a pre-existing relationship seemed to facilitate more open conversations, with these participants being more willing to divulge information. In other instances, the interview participant was an acquaintance of my supervisor, and informing the participant of this relationship had the effect of making interviews more open and free flowing. My background as a local surfer is also likely to have impacted on participants' willingness to engage, especially when participants were surfers themselves. Additionally, it is also likely to have influenced my interpretation of participants' answers because I hold a position regarding the BFP and beach water quality. Finally, as a white male native English speaker, I was able to easily converse with all participants, and this may have resulted in participants feeling comfortable and speaking more freely. However, it must be acknowledged that this is a potential limitation as it could have resulted in the racial and gender skewing discussed in 4.6.4

4.6.3 Time constraints

In one of the interviews, I was forewarned by the participant, Dr Sutcliffe, the former Municipal Manager, that he was too busy to allocate a full hour for an interview, instead affording the researcher a twenty-minute window only, in which to conduct the interview. As a result, a separate interview schedule was drawn up, with the profile development questions omitted (Appendix C). After a brief introduction and explanation of the research aim, the participant proceeded to talk about his knowledge of the BFP in Durban. This had implications for the data collected because I did not have an opportunity to prompt him or ask many questions. However, valuable data was still collected in spite of this constraint.

4.6.4 Gender and racial skewing

The gender and racial skewing among the group of mainly white, male participants, was of concern to the researcher. A reason for this imbalance lies in South Africa's apartheid history, which exclusively reserved many of the 'Golden Mile' beaches for white people, who then gained knowledge of the area. This was alluded to by one of the participants in the broader research project to which this study is linked (Knowledge for Coastal Change Meeting 1, 12/03/2013). In the purposive sampling it was this group who appeared to be most knowledgeable about beach water quality. Furthermore, it is proposed here that, gender and 'race' differences among participants, should not in any way impact on information divulged

regarding beach water quality or the politics surrounding it. However, it needs to be acknowledged that due to apartheid history the participants in the study were predominantly white. It is also acknowledged that in the light of the current racial and class conflicts in the country, the gender and racial skewing in this study is something that warrants careful consideration and the study could have been designed in a manner that more adequately deals with these weighty issues. A possible way in which this could have been overcome is by expanding the selection of newspaper sources to include newspapers that have different racial readerships, such as the *Post* (Indian) or *Ilanga* and *Isolezwe* (Zulu speakers) as this might have resulted in the selection of a wider group of interview participants.

4.7 Conclusion

This chapter presents the methodology employed in the research. The research is qualitative and was designed within the hermeneutic and constructivist paradigm, which assumes that meaning is socially constructed and only understood through interpretation (Kitchin & Tate, 2000; Lincoln *et al.*, 2011; Mottier, 2005; Patton, 2002). A qualitative methodology has been used because qualitative research methods are adept at exploring layers of meaning. These methods are especially appropriate when interpreting individual actors' perceptions and understandings of a specific event, or series of events. Both discourse analysis and thematic analysis are methods used in the qualitative and hermeneutic paradigm, and they therefore inform the research design and methodology (Kitchin & Tate, 2000; Hajer & Wagenaar, 2003; Hajer & Versteeg, 2005b).

A purposive sampling technique was used, in order to identify participants who would be knowledgeable on the subject of the BFP, and 19 participants were sampled, of which 17 were interviewed. A semi-structured, open-ended interview schedule was employed in order to facilitate the capturing of views, opinions and experiences, necessary to identify the environmental discourses held by participants (Berg, 2009; Kitchin & Tate, 2000; Patton, 2002). The primary data collected in the interview phase was fundamental to the research, since it provides the empirical data for the research. Documentary data was used to supplement primary oral data, and included: newspaper articles and letters to the newspapers written by members of civil society (between 2004 and 2014), policy and statutory documents, personal correspondence in the form of email, and photographic evidence.

Dey's (1993) 'omelette approach' to thematic analysis was employed because it provides a step-by-step guide on how to approach a thematic analysis in a systematic manner. Master themes and sub-themes were constituted after identifying various patterns in the data. This analytical technique was instrumental in identifying the dominant discourses expressed by interview participants, which was a necessary step to satisfying the research objectives. A discussion of these environmental discourses follows in Chapter Five and Six, where a synthesis of the data is presented.

CHAPTER 5

UNDERSTANDINGS OF BEACH WATER QUALITY AND THE UNDERLYING KNOWLEDGE OF BEACH QUALITY MONITORING AND MANAGEMENT POLICIES IN ETHEKWINI MUNICIPALITY

5.1 Introduction

This Chapter is the first of two results chapters and presents an analysis of the primary data which focuses on satisfying the first two objectives of the study, namely:

1. To explore understandings of water quality held by a wide range of knowledge holders; and
2. To explore the knowledge that forms the basis of the two different water quality management approaches employed by the Municipality and understand how this knowledge is used.

Satisfying these two objectives provides insight into the foundational water quality discourse and knowledge upon which are based the two systems of beach management employed in eThekweni, and upon which policy decisions about beach management are assumed to be made. This is achieved, in section 5.2, through utilising discourse analysis as a tool for exploring various understandings of sea water quality held by a wide spectrum of knowledge holders.

Section 5.3 assesses the knowledge found at the core of eThekweni's beach management approaches over the past 12 years and considers how this knowledge informs the two different systems used by the Municipality to monitor sea water quality of its beaches.

5.2 Understanding sea water quality

5.2.1 Introduction

This section provides an understanding of the concept of sea water quality held by the knowledge holders and fulfils Objective 1 of the research. Discourse analysis of interview transcripts and newspaper articles reveals four discourses which are classified as either experiential or scientific and technical and which inform understandings of water quality.

These are: the ‘visual or olfactory’; the ‘risk of sea water causing illness’; the ‘microbiological’; and the ‘marine ecosystem’ discourses.

In the context of the ocean, sea water sustains aquatic life, is a recreational, economic and spiritual resource for humans, acts as a sink that absorbs and assimilates gases, liquids and solids, and also as a potential source of human pathogens (Mourato *et al.*, 2003). Participants in this research provided widely varying accounts of their understanding of sea water quality, ranging from purely experiential understandings focused on visual and olfactory cues, to more scientific and technical understandings focused on microbiology, epidemiology and the marine ecosystem. This is testimony to the notion that no single understanding of water quality exists, leading to the assertion that environmental discourses of sea water quality can potentially influence the way in which sea water quality problems and the potential remedies to these problems are conceptualised (Dryzek, 2005).

5.2.2 Experiential discourses of sea water quality

A common way of understanding sea water quality and expressing this understanding is via tacit or experiential discourses, even amongst holders of what could be considered embedded and codified knowledge. This can be attributed to the likelihood that everyone has had some interactions with sea water, in a variety of states, and therefore possesses some experiential understanding of what constitutes sea water quality. In other words, all people have some experiential understanding of how water should feel, look, and taste. All participants in this research indicated that they had engaged in recreational activities at the beach, especially swimming, but also surfing, diving, kitesurfing, and snorkelling. Their experiences with sea water have informed their understanding of sea water quality for recreation and what it means to them. This section discusses how such experiential understandings were expressed by the participants in this research and in newspaper articles. The dominant experiential discourses are: the ‘visual or olfactory’ discourse; and the ‘risk of sea water causing illness’ discourse.

The ‘visual or olfactory’ discourse

This discourse of water quality emerged as one of the dominant experiential discourses and was held by all participants, including those with scientific or technical knowledge implying that beach users, Municipal officials, newspaper journalists, political councillors, and scientists all have an experiential understanding of sea water quality. Larmont (30/09/2014), a surfer

and user of the ‘Golden Mile’ beaches since the 1960s, used these tacit cues when arguing that good water quality “shouldn’t smell ... shouldn’t have oily effluent in it ... shouldn’t have debris in it”. Similarly, Carnie (01/10/2014), an environmental journalist, indicated that he assesses good water quality on the basis of visual cues, arguing that clear, visibly clean water is the goal for good quality beach water. A Municipal official employed in the Coastal Engineering, Storm Water and Catchment Management Department (CSCM) in the Municipality, also claimed to have experiential understandings of sea water quality, suggesting that sea water quality should be assessed in terms of three elements, namely, aesthetics, turbidity, and pathogens (Chrystal, 07/10/2014). He argued that both the aesthetic and turbidity components of water quality can be assessed simply through sight. The identification of the pathogenic component of water quality is influenced by Chrystal’s scientific and technical knowledge and will be explored in the next section on scientific and technical discourses of water quality.

This discourse also emerged as a dominant experiential discourse in the newspaper articles. A number of newspaper articles also pointed to the experiential visual and olfactory discourses of water quality used by beach users, especially surfers, and some residents. A letter to The Mercury Newspaper, written by a resident who lives three blocks from the ‘Golden Mile’, uses the visual/ olfactory discourse to express disgust at the “sewage in the sea [which] can be smelled in my flat” (Du Toit, 09/11/2009). It is typical for lay persons to understand water quality in these terms, as is evident from the assertion by a Warner Beach resident who “smelt [sic] the stench of sewage outside his beachfront flat recently” (Carnie, 15/04/2014 5). Thus, story lines about bad smelling and discoloured water are routine means by which this discourse is expressed using terms such as ‘stench’ and ‘sewage’ to express and characterise the smell.

A discourse analysis of the newspaper articles reveals that surfers, when expressing concerns over poor water quality, also use story lines centred on foul smelling water to argue about how they understand poor water quality; they also refer to discoloured water. It is interesting to note that even a bad odour or discolouration is not always a deterrent to surfers to enter the sea, as cited by a surfer in Sanpath (19/05/2009: 5): “the water smelled different, but we surfed anyway”. A further citation of a regular surfer reported that he “saw a distinct discolouration in the water ... a funny smell ... [but] ... this had not deterred a few surfers who were seen in the water yesterday” (Sanpath, 19/05/2009: 5). One of the interview participants, also a surfer, suggested that irrespective of the condition of the water quality “surfers will surf, they don’t

care about what the newspaper says [regarding contamination of the sea water]” (Jones, 23/09/2014). When prompted further he conceded that this was not always the case and that there had been times when he had made the decision not to use a particular ‘Golden Mile’ beach due to his concern about water quality, explaining that these decisions were typically based on visual cues: “it’s about going down to the beach and seeing it muddy and dirty and [covered in] litter and going, let’s go [further] south [to surf]”.

The basic senses of sight and smell inform the experiential discourses that enable actors to make calculated assessments about water quality, and provide the basis for initial instinctive impulses around usage of sea water for recreation. This is also true of scientific and technical knowledge holders, who will often make initial assessments based on visual and olfactory cues and then evaluate these cues further using technical and scientific knowledge. For example, it is posited that there is a need to be more cautious after rainfall events, especially when noticing increased turbidity outside of the norm, and also that it is necessary to identify potential sources of inputs into the sea water body before making decisions about whether to swim in the sea (Respondent C, 09/10/2014). Generally speaking, visual and olfactory cues are used to inform potential sea users about health risks associated with using the beach as a recreational resource.

The ‘risk of sea water causing illness’ discourse

Another dominant experiential discourse uncovered in the data, focused on the potential health or illness risk associated with poor water quality. This discourse shared equal dominance with the ‘visual or olfactory’ discourse and was held by most knowledge holders, especially beach users (surfers), scientists, and Municipal officials. The ‘risk of sea water causing illness’ is a common way for people to understand and perceive the concept of water quality. It can be surmised that people generally have a natural aversion to getting sick; Carnie (01/10/2014) argues that “even if it [water] is not crystal-clear, it shouldn’t cause you to have health problems”. A Durban resident, commenting in a newspaper article, asserted that “I don’t swim in the sea for fear of contracting diseases” (Du Toit, 09/11/2009: 7). Story lines of health, disease, and illness are expressed by users of this discourse, and these experiential understanding are supported by epidemiological studies and newspaper articles which point to the health risks associated with the faecal contamination of contact recreational waters (Pruss, 1998; Nair, 15/11/2010).

Evidence showed that a number of participants in this study noted that they have either personally become ill from swimming in contaminated sea water or know of people who have. For example, Jones (23/09/2014) shared the health related impacts he and his brother experienced after surfing in contaminated sea water: “I and my brother [sic] have both gotten mildly nauseous after a surf ... we both once got quite nauseous from surfing and that was due to swallowing a bit of water”. Similar sentiments were shared by Larmont (30/09/2014), who indicated that he has recently suffered from skin rashes after surfing at the ‘Golden Mile’ beaches, and also knew of a number of fellow surfers who have suffered stomach related problems after surfing, with one requiring a course of antibiotics. Since Larmont is the owner of a surf shop and has frequent contact with surfers, it can be inferred from his report of poor water quality leading to illness among many surfers, that this is a dominant discourse based on experiential knowledge.

An analysis of newspaper articles suggests that ear-ache (Comins, 04/02/2012), sore throats (Sanpath, 19/05/2009), and infected and festering sores (Comins, 04/02/2012) are recent complaints from local surfers using the ‘Golden Mile’ beaches. Breetzke (13/10/2014) agreed with this when expressing her concerns about health impacts of poor water quality at beaches, arguing that contact with such water can cause “your sores [to] start festering if you’ve got a sore, or the kids get[ting] a runny tummy or something like that”. These accounts indicate that, in the absence of any detailed scientific knowledge to inform experiences with poor water quality, discourses of health and potential health risk are crucial in framing perceptions of water quality. Experiential health discourses of water quality therefore often serve as the initial indicators when it comes to making decisions about using a beach for contact recreation.

Scientific and technical discourses of water quality are more accurate at measuring the specific health-related impacts associated with poor water quality and because of the assumed superiority of scientific and technical knowledge in society these discourses serve to validate experiential health discourses.

5.2.3 Scientific and technical discourses of water quality

Two scientific and technical discourses of sea water quality emerged from the primary data, namely, the ‘microbiological’ discourse which provided an epidemiological understanding, and the ‘marine ecosystem’ discourse. These two discourses were used primarily by scientists

and Municipal officials, although surfers, newspaper journalists and some beach residents also used these discourses to a limited extent to validate their experiential knowledge of sea water quality. Scientific and technical knowledge holders exhibit an understanding of water quality that is typically more detailed since they have a scientific understanding of the potential health related risks of contact with poor water quality. This understanding is expressed in scientific or technical terminology. For example, a statement such as ‘an *E. Coli* count of 250cfu’ would not be fully understood by lay people. At times, this has the potential to make such discourses challenging to interpret for experiential knowledge holders who might not possess the requisite knowledge or vocabulary to understand them. As previously mentioned, it is possible for individuals to use more than one discourse to understand a particular phenomenon. For example, Breetzke (13/10/2014) noted, “maybe I know a bit much [about sea water quality] to want to dabble in the [sea] water, so I don’t do that much swimming because there is a concern that there is a potential to get ill”. This indicates that her professional scientific and technical knowledge informed her understanding of the possibility of illness due to contact with contaminated water.

Analysis of the primary data collected in interviews and also in newspapers reveals a similar aversion to illness in both scientific as well as experiential discourses of sea water quality, although a more scientific terminology is used to express the former. The dominant scientific discourse is ‘microbiological’ and provides an epidemiological perspective of water quality that involves technical measurement procedures. Another technical and scientific discourse with a health-related focus which emerged from the primary data, is an ecological discourse that provides a marine science perspective of water quality. This discourse primarily argues about the importance of good water quality from the perspective of the health of the marine environment. These two scientific discourses are now discussed.

The ‘microbiological’ discourse: the epidemiological understanding

The dominant scientific and technical ‘microbiological’ discourse’ provides an epidemiological understanding of sea water quality. This discourse focuses on the identification and measurement of microbiological indicator organisms which are argued to be carriers of human health risk. It was used primarily by scientists and Municipal officials, but also by surfers, newspaper journalists and Durban residents to a limited extent. Users of this discourse primarily hold scientific and technical knowledge and argue that it is necessary to

know and understand the intended use of a water body before assessing its quality using microbiological indicator organisms (Breetzke, 13/10/2014; Jackson, 16/10/2014; Respondent A, 09/10/2014). It is proposed here that there is an anthropocentric perspective to the microbiological discourse in that it classifies bodies of water in terms of their use, and in the event that a water body is used by humans for recreational purposes, then this discourse comes into play to ascertain the ‘quality of the water’ (Jackson, 16/10/2014; Respondent A, 09/10/2014; Respondent C, 09/10/2014). In these instances, the protection of human health is the ultimate focus of the microbiological discourse.

In the context of contact recreational beach waters, users of the microbiological discourse argue that human health can only be assured, and health risks minimised, by keeping faecal contamination of beach waters to within a specified range. An assessment of contamination is made possible by monitoring and testing beach waters for microbiological indicator organisms, especially those known to be associated with faecal contamination (Jackson, 16/10/2014; Respondent A, 09/10/2014; Respondent C, 09/10/2014; Respondent D, 17/10/2014). There was unanimous agreement by users of this discourse that *E. coli* and *Intestinal Enterococci* are the two main indicators that should be monitored to assess water quality at contact recreation beaches. This understanding is supported by epidemiological studies found in the literature and government policies and guidelines (DEA, 2012; Shibata *et al.*, 2004). That said, some participants argued over the suitability of the conventional indicators in more tropical climates (section 6.3).

A thematic analysis of the newspaper data reveals that the microbiological terminology associated with this discourse is frequently found in the public domain. This could explain why some experiential knowledge holders were able to partially articulate this discourse while not fully understanding it. For example, Jones’ (23/09/2014) assertion that “the water’s disgusting and has high levels of *E. coli* or whatever, not *E. coli*, is it *E. coli*?”, suggests that he holds at least a partial understanding of the microbiological discourse, although he is uncertain about specific scientific details or terminology. The accepted way of reporting on the microbiological dimension of water quality uses the terminology of ‘colony forming units’ per one hundred millilitre water sample, or ‘cfu/ 100ml’. Newspaper data reveals that newspaper reporters and editors alike, assume a certain level of pre-understanding from their audiences, as they frequently use terminology associated with the microbiological discourse, especially when trying to validate the experiential discourses of water quality discussed earlier

in this chapter (Nair, 17/03/2008; Willnecker, 02/07/2008). Because the anthropocentric goal of measuring microbiological indicators is to keep beach users safe, it is common practice for beaches to be closed for recreational use when monitoring indicates elevated levels of faecal contamination (De Boer, 16/05/2008). Additionally, it is expected that people will express concern when results signifying the presence of heightened indicator levels in sea water become known since this indicates potential risk to beach users (De Boer, 16/05/2008; Memela, 19/11/2012; Sweeney, 25/02/2012). This is especially true when there is a perceived lack of an adequate response to this problem by the monitoring authority.

The 'marine ecosystem' discourse

Another use-dependent discourse, held predominantly by marine researchers and marine scientists is the 'marine ecosystem' discourse of water quality. The sensitivity of the marine ecosystem and its response to contamination inputs are of central importance in this water quality discourse. This discourse, as with the 'microbiological' discourse, is also used and understood by experiential knowledge holders, especially surfers, in spite of a potential lack of marine science knowledge. Surfers, through their intimate experience of the ocean, have a keen understanding of the ocean and how it functions. The statement below by Jones (23/09/2014) provides a view of the 'marine ecosystem' discourse informed by his experiential knowledge of the marine ecosystem rather than by marine science knowledge:

“Scientifically, I don’t know what the components and breakdown of it are, I just know that it’s pollutants and other kinds of waste water, and human sewage and stuff like that that goes into our seas [and] is breaking down the quality of water. And obviously the better the quality of water, the better the quality of ocean life”.

This statement is an example of one of the lay discourses of 'science-in-general' proposed by Michael (1992), in which actors define themselves in relation to science in terms of “specific types of knowledge, techniques and goals” (Michael, 1992: 321). The lay discourse of 'science-in-general' proposes that the public understands scientific knowledge as exclusive, technical, and practical and therefore beyond the comprehension of laypersons. Michael (1992) suggests that laypersons use this discourse as a means of downplaying the value or importance of their non-scientific or experiential knowledge and the statement by Jones

therefore provides insight into the entrenched, orthodox relationship between science and the public in which scientific knowledge is prioritised over other forms of knowledge.

The ‘marine ecosystem’ discourse evident among the participants speaks to the complexity and sensitivity of the marine ecosystem and the potentially serious impacts that contamination can have on marine species. For example, Sutcliffe (cited in Jones, 11/01/2008: 3), in response to a fish kill in the Durban Harbour in December 2007, argued that “this type of fish kill is known to have occurred in other parts of the world due to processes of urbanisation and development We need to develop a better understanding of this sensitive ecosystem”. This discourse is also concerned with heavy metal contamination (Chrystal, 07/10/2014; Fennessey, 23/10/2014) because toxic elements in sea water have the potential to impact negatively on the marine ecosystem, including humans. Jones (23/09/14) firmly believes that humans are a component of the marine ecosystem, arguing that contamination is problematic “for humans that use the sea too”.

The discourses of sea water quality discussed above, namely, the ‘visual or olfactory’, the ‘risk of sea water causing illness’, the ‘microbiological’, and the ‘marine ecosystem’ discourses enable those who use them to understand and interpret information they receive about sea water and express what sea water quality means to them. Additionally, these discourses allow users to conceive of potential causes of poor water quality and therefore promote or argue for certain courses of remedial action. Knowledge about sea water quality, whether experiential, technical or scientific, provides a framework for understanding potential inputs, associated risks and their remedies, and in the case of eThekwin, is influential in informing decisions regarding how best to manage the sea water quality of ‘Golden Mile’ beaches.

5.3 eThekwin beach water quality knowledge

5.3.1 Introduction

Over the past 12 years (2002 – 2014), eThekwin has employed two distinctive approaches to monitor and manage the water quality of its beaches, especially those on the ‘Golden Mile’. Each of these approaches is informed by knowledge of beach water quality and has been employed to fulfil specific management imperatives held by eThekwin at the time of implementation and operation. The first approach is the Blue Flag Programme (BFP), an international approach focusing on beach user safety (Breetzke, 13/10/2014; Datadin,

17/10/2014; Fennessey, 23/10/2014; Jackson, 16/10/2014; Respondent C, 09/10/2014; Respondent D, 17/10/2014). The BFP approach was implemented at a Municipal scale between 2001 and 2008 and again from 2013 to the time of this study. The management of beach water quality is an essential component of this approach but not the only element (Appendix A has a more detailed list of the BFP criteria). The second management approach, also employed at a municipal scale, was an 'in-house' management system (the Municipal Programme) developed by eThekweni Municipality's Water and Sanitation Department. While also concerned with beach user safety, its sole focus was water quality monitoring and the public sharing of the results. It replaced the BFP and was implemented between 2008 and 2013.

At the core of each of these two approaches lies knowledge about the causes of poor sea water quality and its potential remedies. Understanding what this knowledge is in each case and how it informs each of the management approaches is one of the main objectives of the study, and will help to understand why the BFP was contested within the Municipality.

5.3.2 The Blue Flag Programme as an approach to sea water quality management (2001 to 2008 and 2013 to the time of the study)

In Durban's recent history, the BFP has been officially adopted, at a municipal scale, to manage beach water quality for two periods: from 2001 to 2008; and from 2013 to the time of the study (Fig.3.4). Water quality management is a central element of this approach (Appendix A) (FEE, 2014). While much of the knowledge underpinning this approach is available in the literature and online through the Blue Flag webpage (www.blueflag.org), an analysis of data collected in this study from interviews and newspapers reveals the public perception and understanding of the BFP and its knowledge base.

Across the board, all participants were able to articulate at least a partial understanding of the BFP and the foundational knowledge supporting the programme. This can potentially be attributed to two reasons:

1. A purposive sampling technique targeted participants assumed to have knowledge of the BFP, either through their participation in the decision-making around eThekweni's involvement, or by being involved in the coastal zone in eThekweni, either professionally, politically, or recreationally (i.e. surfers); and

2. The highly publicised nature of the debate around eThekweni's association with the BFP imparted enough knowledge regarding the BFP for most participants to have an understanding of this management system.

A thematic analysis of primary data collected in interviews reveals a number of patterns in participants' understanding of the BFP and the knowledge used to inform both its establishment and sustainability as a beach management and water quality monitoring approach. These patterns are identified as a number of discourses that have varying degrees of dominance and influence. These discourses are: the 'Blue Flag beaches for Tourism' discourse; the 'international credibility' discourse; the 'politically independent programme' discourse; and the 'holistic or broad' discourse (Fig. 5.1), all of which are used by different stakeholders supporting and arguing for the BFP's use.

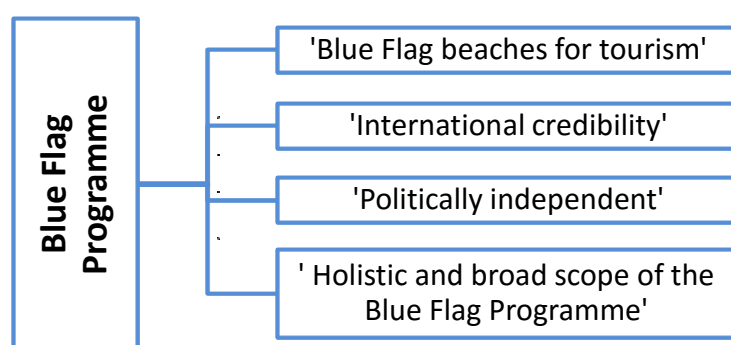


Figure 5.1. Discourses related to the Blue Flag Programme knowledge base

The 'Blue Flag beaches for tourism' discourse

The 'tourism' motivation for wanting to attain Blue Flag accreditation for beaches emerged as a dominant discourse. All knowledge holders who participated in interviews, including eThekweni officials who rejected the management imperatives of the approach, expressed an understanding of this component of the knowledge base (Breetzke 13/10/2014; Carnie 01/10/2014; Chrystal, 07/10/2014; Datadin, 17/10/2004; Jackson, 16/10/2014; Jones, 23/09/2014; Kelly, 01/11/2014; Larmont, 30/09/2014; Pullan, 03/10/2014; Respondent C, 09/10/2014; Respondent D, 17/10/2014; Sutcliffe, 03/11/2014). According to Weerts (28/10/2014), tourism is not the only motivation for attaining accreditation but it is definitely "the low hanging fruit" because tourism can theoretically support an industry and drive local economic development in a municipality, especially where there is a need for poverty

alleviation and job creation in a developing country (Kaplan, 2004; Maharaj *et al.*, 2006; Nel *et al.*, 2003). The importance of the tourism value of the BFP leads to this being the discourse dominating the debate about the importance of the BFP as a beach management programme.

Alison Kelly, former coordinator of the Blue Flag SA Programme, expressed an acute awareness of the tourism value of Blue Flag accreditation, arguing that “a main motivation of having a Blue Flag is the amount of money generated by visitors” (Kelly, 01/11/2014), a claim substantiated by reference to an economic assessment of a Blue Flag beach at Margate, on KZN’s south coast, which suggested that a Blue Flag beach is worth as much as R100 million a year to a coastal municipality (Nahman & Rigby, 2008). In a neoliberal economic context, cities within the same country compete with each other for market share of tourism. Cape Town and Durban are the main competitors in South Africa’s coastal tourism market, a fact alluded to by a number of knowledge holders (Carnie, 01/10/2014; Chrystal, 07/10/2014; Pullan, 03/10/2014). Analysis of newspaper data suggests that Durban citizens also understood the tourism value of Blue Flag accreditation. John Barton, the chairman of the KZN Growth Coalition argues that:

“... business is ‘absolutely mystified’ why anyone would not want Durban’s beaches to have Blue Flag status ... other beaches ‘up the coast’, which would eventually get Blue Flag status, would reap the benefits. Tourist numbers would drop as a result of the loss of the Blue Flag status and Durban beachfront hotels would suffer” (Barton cited in De Boer & Cole, 06/08/08: 3).

Blue Flag accreditation is attractive to international tourists from first world countries in Europe because it is a system of beach management and grading with which they are familiar (Larmont, 30/09/2014; Respondent A, 09/10/2014. For Respondent A (09/10/2014) this is because “foreign tourists inherently feel unsafe about South Africa so when they see a recognisable symbol of safety, such as the Blue Flag, they feel safer”. Expressing his understanding of the marketing power of Blue Flag, Larmont (30/09/2014) cynically argued that:

“... at the end of the day, it is all about money. If you want European tourists to visit then you need to apply the norms and standards that are acceptable for these tourists. Blue flag is seen as primarily tourist marketing tool which

equals more money. Money is spent when people feel safe, when there is clean water to swim in. Affirmative action and BBEEE is not important to tourists but Blue Flag is. The socio-political concern is not important to tourists”.

Pullan, (cited in Nair, 29/06/2012: 3), quoted in the popular press, is insistent that Durban is “the country’s premier beach tourist destination, [and] it is only right that our beaches are measured at international standards”, while Rose (cited in Aberdeen, 14/06/2013: 3) provides an insight into her understanding of the competitive nature of neoliberal economics in her argument that “if popular beaches along the coast, from Cape Town to Kosi Bay, have it [Blue Flag status], then we need it as well. We have to keep up with the Joneses”. Both statements provide insight into the inter-city competition for tourism revenue and the public perception of Durban’s failing ability to attract tourists (De Boer, 02/07/2008).

The international credibility’ discourse

All knowledge holders expressed awareness of the ‘international’ status of the BFP, with most correctly indicating that it was established in Mediterranean Europe (Breetzke, 13/10/2014; Carnie, 01/10/2014; Datadin, 17/10/2014; Fennessey, 23/10/2014; Jackson, 16/10/2014; Jones, 23/09/2014; Larmont, 30/09/2014; Pullan, 03/10/2014; Respondent D, 17/10/2014). However, very few participants were able to pinpoint France as the country of origin, indicating that the approach was known to most knowledge holders purely because it was perceived as having been “started somewhere in Europe” (Weerts, 28/10/2014) and was therefore an ‘international’ initiative. This point is reiterated by Respondent C (09/10/2014), who, when prompted on his awareness of other beach management approaches, stated that “I’ve only really been interested in the Blue Flag because I know it is international”. For Carnie (01/10/2014) and Jones (23/09/2014), the ‘international’ status of the approach is the source of its credibility and legitimacy; the perceived value and credibility of an internationally accredited approach exists because there is a perception that ‘international’ is preferable to local since the technical experts who hold the requisite codified knowledge are found in the north and in Europe.

The ‘politically independent programme’ discourse

Another component of the BFP highlighted by knowledge holders interviewed in this study relates to the credibility of the approach, which according to many, is also attained through its independence (Pullan, 03/10/2014). The BFP is branded as an eco-label, and accreditation

carries with it requirements for ‘independence’ (FEE, 2014). As an NGO, FEE is ‘independent’ from any national government and is therefore administered and run as an ‘independent’ organisation. The BFP, administered by FEE, is argued to be an ‘independent’ approach subject to ‘independent’ auditing. FEE is responsible for setting microbiological parameters for water quality for the BFP (Appendix A presents a full list of the BFP’s criteria) and requires ‘independent’ water quality monitoring and grading in line with these parameters. For some knowledge holders, the ‘independence’ discourse is used to argue for the legitimacy of the tool. For example, Pullan (03/10/2014) stated that “Blue Flag is an external and independent body [and its] credibility is attained through independence”. Fennessey (23/10/2014) and Carnie (01/10/2014) also noted that objectivity, transparency, and external auditing are critical elements of the approach which are the result of its ‘independence’. External auditing is considered necessary in order to ensure that all elements of what is perceived of as a ‘holistic’ approach are effectively adhered to.

The ‘holistic and broad scope of the Blue Flag Programme’ discourse

The ‘holistic’ nature of the BFP is a further feature argued for by the majority of participants, including Municipal officials. This implies that most participants are aware that there are multiple criteria that must be adhered to in order to obtain accreditation at a given beach site. For example, Jackson (16/10/2014) expressed a keen understanding of the ‘holistic’ nature of the approach, indicating that “Blue Flag is holistic and focuses on water quality, facilities, [and] environmental learning [and therefore] water quality is not the sole focus”. A similar level of understanding was communicated by Respondent A (09/10/2014) and Respondent C (09/10/2014) who both expressed their understanding that Blue Flag is an approach that focuses on more than just water quality monitoring. Respondent D (17/10/2014) proposed that it is system that is:

“all encompassing, rather than just how’s the water quality, it is [an] internationally recognised, holistic management approach, not just focused on what is happening on the beach ... it is holistic and tries to get more standardisation and control over how beaches are managed”.

It was also argued that the BFP is ‘holistic’: “the BFP has an environmental education and management focus but it is a holistic programme (Datadin, 17/10/2014). While these particular participants were able to express a full understanding of the ‘holistic’ nature of the BFP, the majority did not have this understanding. It can be inferred however, that for most interview

participants, the credibility of the programme is derived through its 'holistic' approach to beach management.

In conclusion, participants interviewed in this research used a number of discourses when debating the knowledge base of the BFP and arguing for its credibility as a beach management programme. The discourses reveal the most prominent themes that were expressed in the newspaper articles. A discussion of participants' understandings of the Municipal Programme's knowledge base follows.

5.3.3 The Municipal Programme to marine water quality management (2008 to 2013)

It is argued that the Municipal Programme is defined as much by what it rejects of the BFP as by what it deems significant. Discourses of the Municipal Programme focused on refuting or rejecting the discourses of the BFP presented above. The discourses used by participants to understand the Municipal Programme and either argue for or reject its suitability are: the 'in-house or local' discourse; the 'self-sufficient or autonomous' discourse; and the 'narrow water quality focus' discourse (Fig. 5.2).

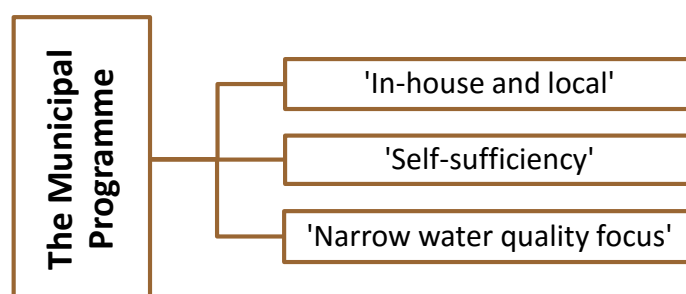


Figure 5.2. Discourses related to the Municipal Programme knowledge base

Most participants interviewed were aware that eThekweni had withdrawn from the BFP and instituted an alternative approach, but they were unable to articulate a detailed understanding of what this latter approach entailed. For example, Respondent C (09/10/2014) indicated an awareness of the "eThekweni ... system but [was] not aware of specifics". The widespread awareness of the Municipal Programme is possibly attributed to the high level of publicity received in the popular press regarding the Municipality's decision to withdraw from the BFP (Carnie, 27/03/2008; De Boer & Cole, 06/08/2008). It is argued that the limited understanding

of the specific management objectives of the alternative Municipal Programme is a result of the system being an ‘in-house’ approach, developed by ‘experts’ from the eThekweni Water and Sanitation Department in the absence of any public input or debate. The lack of information available to the public regarding the Municipal Programme is another possible reason for the inability of knowledge holders to express an understanding of the approach.

Analysis of data collected from interviews and newspapers reveals that the Municipal Programme is essentially a response by the eThekweni Municipality to the BFP’s argued shortcomings (discussed in more detail in section 6.3.3).

The ‘In-house/ local’ discourse

In contrast to the BFP’s international status, the Municipal Programme to beach management was dominated by the ‘in-house/ local ‘ discourse which argued that the approach was designed and developed ‘in-house’ by eThekweni’s Water and Sanitation Department and should therefore be considered a local approach. This discourse was used by Municipal officials and the former Municipal manager to argue for the superiority of the Municipal Programme. These participants insisted that a local approach to beach management was a necessity for Durban because of its climatic conditions. Specifically, sea water temperatures were considered too warm in comparison with those the BFP was intended to manage (Chrystal, 07/10/2014; Jackson, 16/10/2014; Sutcliffe, 03/11/2014) (this is discussed in more detail in section 6.3.3).

This rejection of the BFP’s appropriateness for Durban in the discussion was picked up by some of the other participants, namely the surfers, the media, and one of the Municipal officials (Larmont, 30/09/2014; Mather, 30/09/2014; Weerts, 28/10/2014) and was also reported on in the popular press (Carnie, 14/03/2008; Macloed, cited in Carnie, 25/03/2008; Padayache, 29/06/2010). Related to the ‘in-house’ design of the locally specific Municipal Programme is the critique of the lack of independence with regards to the monitoring and evaluation of beach water quality.

The ‘self-sufficient/ autonomous’ discourse

The participants supporting the Municipal Programme also used a ‘self-sufficient/ autonomous’ discourse to argue for the effectiveness of the approach. The majority of the Municipal officials and the former Municipal manager were the only users of this discourse and can therefore be inferred to be the only supporters of the Municipal Programme. By way

of contrast with the BFP's characteristic of political independence, the Municipal Programme is not considered politically independent because of its in-house design by the Municipal Water and Sanitation Department. The grading system and microbiological parameters for eThekweni's beaches found at the core of the Municipal Programme were also designed 'in-house' by 'local' experts, another argument for the 'self-sufficiency' of eThekweni's local expertise. Furthermore, the Municipal Programme does not call for independent monitoring and evaluation of water quality, insisting instead on the 'self-sufficiency' of its own technical experts based in the Water and Sanitation Department (Carnie & Wolhuter, 14/06/2013; Chrystal, 07/10/2014; Jackson, 16/10/2014; Sutcliffe, 03/11/2014).

The proponents of eThekweni's 'self-sufficiency' discourse argue that the narrowing focus of beach management to a single dimension, namely sea water quality, would result in more effective and sustainable beach management (Jackson, 16/10/2014; Sutcliffe, 03/11/2014). Conversely, evidence shows that a number of participants view the lack of requisite political independence as a critical flaw of the Municipal Programme (Breetzke, 13/10/2014; Kelly, 01/11/2014; Larmont, 30/09/2014; Respondent D 17/10/2014) (discussed in more detail in section 6.3.3). Surfers, scientists, and the former coordinator of Blue Flag SA all critiqued the Municipal Programme on this basis. Supporters of the oppositional discourse of the Municipal Programme, did not consider the lack of political independence problematic, given the 'self-sufficiency' and credibility of the technical knowledge held by the Municipality's laboratory technicians:

“... our laboratory is accredited by the South African National Accreditation System, and is one of the few labs in the province to have this accreditation ... [it] is running the most stringent quality tests that test the quality of water for drinking” (Macleod, cited in Fourie, 04/07/2012: 5).

The 'narrow water quality focus' discourse

This discourse is linked to the 'self-sufficiency' discourse discussed above in that it also argues that narrowing the focus of beach management efforts to a single dimension, namely water quality, would result in a more sustainable beach management approach. The participants adopting this discourse are Municipal officials and the former Municipal manager (Chrystal, 07/10/2014; Jackson, 16/10/2014; Sutcliffe, 03/11/2014). This suggests that sea water quality monitoring and evaluation is seen as a core component of beach management by these

participants. For example, Jackson (16/10/2014) suggested that the view held by the Water and Sanitation Department was “let’s sort the water out, let’s get that done ... once you’ve got that working, you can add all these other things [that the BFP requires]”. This belief in the effectiveness of a narrower focus is echoed in the former Municipal manager, Sutcliffe’s (03/11/2014) assertion that “the primary function of the Water and Sanitation Department is to ensure that the quality of water and sanitation in our city is the best that we can have”. Furthermore, both Jackson (16/10/2014) and Sutcliffe (03/11/2014) were adamant that the South African water quality guidelines for recreational beaches are sufficiently robust and should be used as the basis for the Municipal guidelines instead of the BFP’s guidelines.

In spite of limited understanding of the intricacies and requirements of the Municipal Programme by surfers, scientists, the media and even some Municipal officials, a number of these participants were aware that it was driven from a water quality perspective (Mather, 30/09/2014; Fennessey, 23/10/2014; Jones, 23/09/2014; Larmont, 30/09/2014). This was to be expected given the high levels of adverse publicity by the popular press towards the Municipal decision to institute the alternative Municipal Programme. For example, Andrew Layman, of the Durban Chamber of Commerce, has been very critical about the Municipal rejection of the BFP and its instatement of the Municipal Programme for eThekwin’s beaches, arguing that:

“despite its recent antipathy towards Blue Flag, the municipality has a rigorous sea-monitoring programme so as to ensure that the water is as safe as possible for bathing” but that the unrecognised approach has not enabled “a major tourism asset of the city ... [to be] exploited sufficiently despite the excellence of the promenade development” (Layman, 28/11/2012: 8).

According to Jackson (16/10/2014), the focus on the single consideration of water quality ensures that the scientific imperatives of water quality management can be rigorously applied. Indeed, she argued that the Blue Flag’s holistic approach and “focus on tourism detracts from the science of water quality monitoring and management”.

5.4 Conclusion

Both beach management approaches employed by eThekwin over the past 12 years have been critiqued or supported by the discourses discussed above, namely: ‘Blue Flag beaches for tourism’; the ‘international credibility’; the ‘politically independent programme’; the ‘holistic

or broad'; the 'in-house/ local; the 'self-sufficient or autonomous'; and the 'narrow water quality focus' discourses. There are similarities in the knowledge underpinning each approach as well as in the assumptions that inform this knowledge. For instance, supporters of both approaches feel that their respective approach to beach management is credible and focused on beach safety. These beliefs are based on conjectures regarding how best to manage beach water quality, with Blue Flag opting for a holistic perspective focused on sea water quality and beach aesthetics and the Municipal Programme concerned only with sea water quality management. However, while there may be some similarities in the knowledge underpinning them, they are mainly characterised by their contrasting assumptions regarding the imperatives for beach management. This knowledge is embedded in the language or discourses used by the supporters or detractors of each approach. Figure 5.3 below summarises the discourses and assumptions or beliefs on which each approach is based.

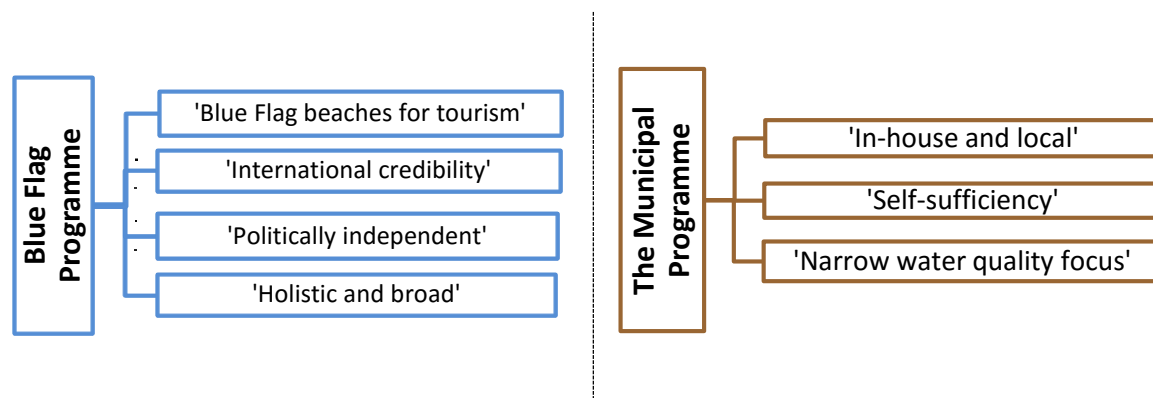


Figure 5.3. Discourses related to the contrasting knowledge bases of the Blue Flag Programme and the Municipal Programme.

A more thorough discussion centred on the political debate and 'argumentative rationale' surrounding the BFP, and eThekwin's rejection thereof follows in the next chapter, which explores the political dimension of beach water quality management in Durban and eThekwin and the manner in which the knowledge base of each approach was contested.

CHAPTER 6

THE POLITICS OF WATER QUALITY MANAGEMENT IN ETHEKWINI MUNICIPALITY

6.1 Introduction

The purpose of this Chapter is to present an analysis of the primary data that seeks to satisfy the second two objectives of the study, namely:

1. To explore the politics in relation to the adoption of these different management approaches within the Municipality; and
2. To assess which of Callon's (1999) three models of knowledge production is most applicable to each of the water quality management approaches adopted by the Municipality.

This is the second results chapter of this thesis. It discusses the political dimension of water quality management in eThekweni through an analysis of the discourses present in the primary data. It is argued that these discourses are used by various actors and discourse coalitions to understand and interpret the two beach management approaches adopted by eThekweni over the 12 years between 2002 and 2014, and to argue for, or reject these approaches and the decision-making processes that resulted in their adoption.

This is achieved, in section 6.2, by initially presenting a brief discussion on the importance of actors in deliberative processes, before exploring the various actors who were engaged in the politics. The analysis identifies two dominant discourse coalitions. The character of these coalitions, the manner in which they were formed and the actors included in each are presented in Figure 6.1.

Section 6.3 addresses Objective 3 of this study by exploring the public's engagement with eThekweni's sea water and beach management policies. It is proposed that the primary data reveals four phases of engagement present in the debate about the involvement of the eThekweni Municipality in the Blue Flag programme (BFP).

The fourth objective of the study is satisfied in section 6.4 which analyses the four phases of engagement according to Callon's (1999) three models of knowledge production, namely, the Public Education Model (PEM), the Public Debate Model (PDM), and the Co-Production of Knowledge Model (CKM). The links between these three models and mode 1 and mode 2 knowledge production are also explored. It is suggested that true co-production of knowledge between the eThekweni Municipality and the public was not realised in the four phases of engagement but rather that a continuum between the PEM and PDM was evident (Fig. 6.2).

6.2 Actors and discourse coalitions politically engaged in contesting eThekweni's sea water and beach management policies

An actor can be defined as a participant in a particular process. Actors possess agency and have the power to make decisions and act on those decisions. In deliberative processes actors play an important role because the power and dominance of certain actors can galvanise support for a particular course of action and thereby impact on policy outcomes (Brockhaus *et al.*, 2014; McQuirk *et al.*, 2014; Muñoz-Erickson, 2014). Furthermore, the potentially multiple interpersonal networks of relationships in which actors are immersed are fundamental mechanisms by which influence and power is exerted. In particular, the power of actors can influence policy decisions through the establishment of discourse coalitions.

A discourse coalition is a grouping of actors who use a similar discourse to understand a particular phenomenon and to argue for a particular course of action (Brockhaus *et al.*, 2014; Hajer, 2006). In this way they seek to exert power to support their interests and contest opposing discourses. While they use a similar discourse to understand a particular situation, the actors who are part of a discourse coalition may potentially have limited knowledge of the coalitions' existence. In this way, discourse coalitions can be either formally or informally constituted (Hajer, 2005, 2006). In the case of this research, two distinct discourse coalitions have been identified, although the manner in which they were formed differs markedly.

6.2.1 The Municipal discourse coalition

On the one hand, a formally constituted discourse coalition was formed to argue for the credibility of the Municipal Programme of sea water quality management and at the same time, to discredit the BFP. This discourse coalition has been termed the Municipal discourse

coalition and comprises the former Municipal Manager, the former Head of the eThekweni Municipality Water and Sanitation Department, and other Municipal officials. The strength of the story line presented by this discourse coalition emanates from the power and authority vested in its champion, the former Municipal Manager, Michael Sutcliffe, and in the structured Municipal hierarchy within which the remaining coalition members were embedded. As the delegated representative of the politically elected African National Congress (ANC), the Municipal Manager would be expected to receive broad spectrum political and civil society support, while as the head of the Municipality, all other officials would be subordinate and expected to fulfil their mandates under his leadership.

6.2.2 The Blue Flag Programme discourse coalition

In contrast, the second discourse coalition identified in this research was informally constituted and argued for the credibility of the BFP while discrediting both the Municipal Programme and the decision to withdraw eThekweni's beaches from the BFP. This coalition is referred to as the BFP discourse coalition. It comprises a number of actors from Durban's civil and professional society, such as surfers, newspaper journalists, scientists, and members of the NGO, WESSA. In contrast to the Municipal discourse coalition, it was not consciously formed by its members with the purpose of arguing for the BFP's credibility. It is argued rather that its establishment was made possible via the enabling environment created by the popular press and investigative journalism reporting on the topic of eThekweni's perceived inability to adequately manage its sea water quality. The media alerted its readers to the shared understanding or story line on the BFP controversy and in so doing, provided an informal arena or 'space' within which they could act. The power of this coalition was attained through its wide public support and the pressure it exerted. The wide range of actors found in the BFP discourse coalition indicates not only the scale of support for the programme. This discourse coalition rejected the Municipal decision to withdraw from the international programme, as well as the establishment of the Municipal Programme which was argued to be better than the BFP by the Municipal discourse coalition.

The character and composition of these discourse coalitions and their relationship with one another is graphically illustrated in Figure 6.1 on the following page.



Figure 6.1. Conceptualisation of the characteristics of, and relationship between, the two discourse coalitions and their members (the arrow shows contestation and conflict between the two coalitions)

The argumentative exchange between these two discourse coalitions during the four phases of the debate over eThekweni's involvement with the BFP is now discussed (Fig. 6.2).

6.3 Phases of political support for the Blue Flag Programme

6.3.1 Introduction

Discourse analysis of the primary data collected in this research provides important insights into how the environmental policy-making in relation to the BFP unfolded in eThekweni because discourse analysis enables the tracing of patterns or regularities in the sentiments of actors (Hajer & Versteeg, 2005b). Since actors position themselves in deliberative processes by using language, identifying the potentially argumentative discourses⁹ used by the discourse

⁹ Argumentative discourses are the competing discourse used by actors to ensure that their particular positions are considered and incorporated into policy. They are an essential component of deliberative processes since they are the means by which actors position themselves within the policy arena (Hajer, 2005).

coalitions present in the engagement with the debate provides insight into the political manoeuvring of different interest groups within the eThekweni policy arena (Hajer, 2005). In this way, it is proposed that the role of politics in the deliberation about eThekweni's involvement with the BFP will become evident.

A discursive and thematic analysis of the primary data revealed four distinct phases of political support for the BFP by the Municipality, Blue Flag, and the public. Four dominant discourses were used during these four phases: 'political support and advocacy'; 'defiance'; 'rejection, despair, and hope'; and the 'willingness to rethink or conciliation' discourses. Figure 6.2, illustrates these four phases of engagement and the discourses prevalent during these four phases, on the same temporal scale used in Figure 3.4. It further illustrates some of the events that acted as potential triggers influencing the shifts in engagement. The argumentative and competing discourses adopted by the Municipal discourse coalition and the BFP discourse coalition during phase 2 of the engagement are represented by the red dotted line and the multi-directional arrows which transverse this line.

6.3.2 Phase 1: 'Political support and advocacy' discourses

There were two periods in which 'political support and advocacy'¹⁰ discourses were adopted by eThekweni and the public. Initially, these discourses were evident in 2001 when the political decision was taken by the Municipality to join the BFP. Both eThekweni officials and the public offered wide support for this decision. Following a number of discursive shifts, 'political support and advocacy' discourses were used again when the political decision to re-join the BFP was taken in 2013. Once more, the decision was widely supported by eThekweni officials, the public and a number of political bodies.

In 2001, when eThekweni decided to join the BFP as the first coastal municipality to do so outside of Europe, there was an outpouring of 'political support and advocacy' for the programme and the understanding that eThekweni's beaches would now be accredited by an independent and international body. The assertion, by the former Municipal Manager, that "we started and we certainly were great advocates [of the BFP]" (Sutcliffe, 03/11/2014), provides a clear indication of the level of political support for the BFP that existed in eThekweni at that time. There were a number of politicians who made similar statements in the initial years after

¹⁰ Advocacy is understood to refer to support or commendation for a particular cause or policy.

joining the programme. For example, two former Municipal mayors, Obed Mlaba and Logie Naidoo, both expressed public support for the programme and pride at receiving international accreditation for eThekweni's beaches. At the time, Mlaba (cited in Metro Reporter, 29/10/2004: 1) suggested,

“ ... if we need any confirmation that our beaches are great this is it. This is just one of the reasons why, year after year, South Africans come to this city for their holidays, not just in summer but all year round. We are proud of our beaches, of our natural heritage and we are committed to preserving them”.

In a similar vein, two years later, Naidoo (cited in Packree, 23/10/2006: 3) made reference to the pride emanating from having internationally accredited beaches in eThekweni, stating, “this is a great achievement from a tourism point of view. We feel extremely proud to have so many Blue Flag beaches and we are confident that our beaches will maintain their status”.

Alison Kelly (01/11/2014), coordinator of the Blue Flag SA Programme at the time, indicated that because eThekweni were such great advocates of the programme, the “original plan for Durban was that they were going to have a solid Blue Flag beach from the mouth of the uMgeni, to uShaka”. Other high-ranking officials also articulated this vision in the popular press, with Christo Swart, Deputy Head of eThekweni Parks, Recreation and Cemeteries, suggesting a broad expansion of the programme from five accredited beaches in the 2005/ 2006 season to 12 beaches in the 2006/ 2007 season (Swart cited in, Nzama, 28/10/2005). The expansion of the BFP to include more eThekweni beaches was also alluded to by a number of interview participants and newspaper articles (Bishop, 21/10/2006; Fennessey, 23/10/2014; Mather, 30/09/2014; Nzama, 28/10/2005; Respondent A, 09/10/2014; Respondent B, 09/10/2014; Sutcliffe, cited in, Metro Reporter, 29/10/2004). The ‘political support and advocacy’ discourse was also shared by provincial and national government bodies. In 2005, as an expression of the level of political support at a national level, the DEA announced that it would provide R2 million in financial assistance for Blue Flag SA to enable it to continue to expand to other coastal municipalities around the country (Cole, 11/05/2005).

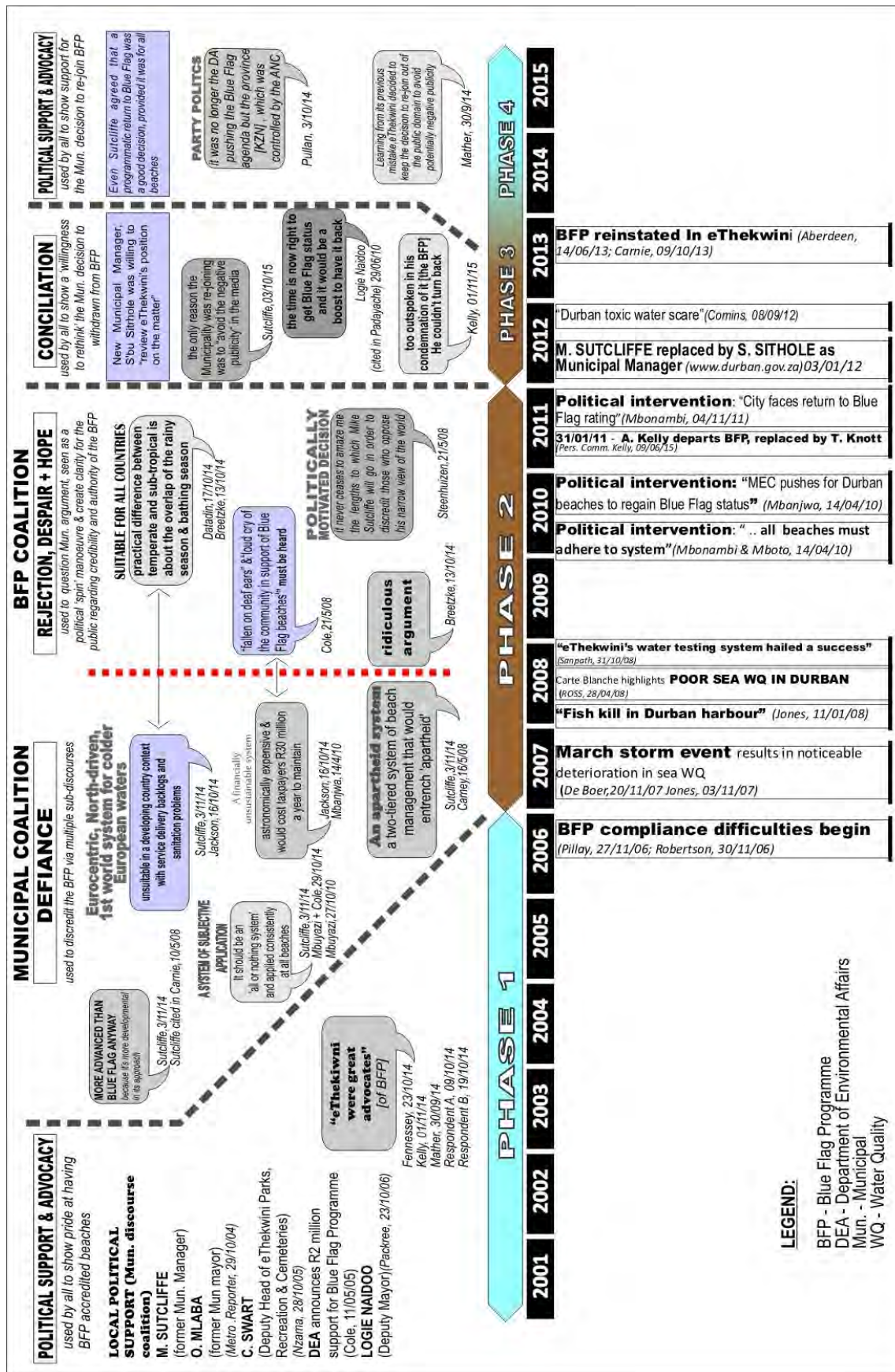


Figure 6.2. The four phases of political engagement over water quality management in eThekweni

6.3.3 Phase 2: Discrediting Blue Flag through discourses of ‘defiance’

In the policy arena, it is common for actors to engage one another using, what Hajer (2005), refers to as an ‘argumentative rationality’. The second distinct phase identified in the discursive landscape was characterised by this ‘argumentative rationality’ as eThekweni sought to dominate and control the public discourse around its beach water quality and the BFP. The Municipality embarked on a political campaign to discredit not only the programme, but also WESSA, the South African NGO coordinating the BFP, as well as FEE, the international parent organisation of the programme. This campaign was highly publicised by the popular press which was drawing attention to the failing water quality of Durban’s ‘Golden Mile’. The discourse that accompanied this political campaign is one of ‘defiance’, expressed primarily by a discourse coalition comprising the former Municipal Manager, Michael Sutcliffe, the former Head of eThekweni’s Water and Sanitation Department, Neil Macleod, and other Municipal officials.

The ‘defiance’ discourse is a multi-faceted rejection of the BFP, WESSA, and FEE dominating from 2007 to 2012 and includes a number of the sub-discourses used by the Municipal discourse coalition (Fig.6.2). The facets or dimensions of the ‘defiance’ discourse are presented in Figure 6.3 below and are proposed as sub-discourses of the ‘defiance’ discourse.

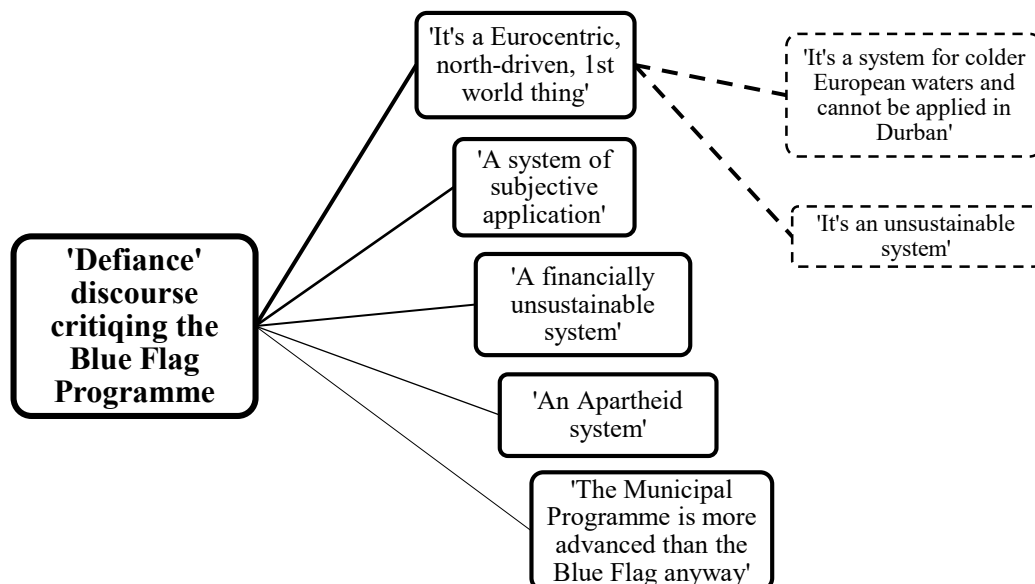


Figure 6.3. Discourse tree illustrating the multiple sub-discourses of the ‘defiance’ discourse of the Municipal discourse coalition.

The ensuing campaign attempted to create a narrative which cast the Municipal decision to withdraw from the BFP in a favourable light by discrediting the Blue Flag approach. Some interview participants argue that this was a politically shrewd manoeuvre on the part of the Municipality because it created doubt in the public domain regarding the credibility of the BFP (Breetzke, 13/10/2014; Respondent D, 17/10/2014). The multi-faceted discrediting campaign was focused on the core issue of the irrelevance of the standards espoused by FEE for eThekweni.

'It's a Eurocentric, north-driven, 1st world thing'; 'it's a system for colder European waters and cannot be applied in Durban'; and 'an unsustainable system'

The Municipal discourse coalition initially discredited the BFP by proposing that water quality criteria espoused by the approach were based on European norms that were not applicable to the South African context (Carnie, 14/03/2008; Padayachee, 29/06/2010; Sutcliffe, 03/11/2014). Evidence in the primary data suggests that the debate was centred on the suitability of BFP for temperate versus sub-tropical climates¹¹ and reveals that this was the dominant sub-discourse of the 'defiance' discourse which was in itself comprised of two related arguments.

This assertion was supported by Neil Macleod from the Water and Sanitation Department, who argued that "the WHO guidelines are Eurocentric ... based on studies that were done in colder European waters and cannot be applied to Durban" (Macleod, cited in Carnie, 25/03/2008). It is argued that Sutcliffe and Macleod formed the core of the Municipal discourse coalition (Fig. 6.1) in order to create a story line questioning the applicability of 'Eurocentric' criteria in the eThekweni context. This was thrust into the public domain through the popular press: 'Blue Flag beach status in question' (Pillay, 27/11/2006); 'Beaches won't get the Blues' (Jones, 03/11/2007); 'Double standards or a drop in quality' (Carnie, 01/09/2008); 'Red flag for blue flag beaches' (Carnie, 14/03/2008).

Sutcliffe (cited in Carnie, 16/05/2008: 1), further argued that, "if we, as Africans, must suddenly roll over and die because there are a few Europeans out there ... then you are wrong", thus emphasising the African character of the Durban context. The story line questioning the suitability of the 'Eurocentric' water quality criteria for eThekweni was picked up on by Carnie

¹¹ As discussed in Chapter Three of this thesis, Durban's climate is classified as sub-tropical and is characterised by relatively warm, wet, and humid summers, and mild and dry winters.

(14/03/2008: 6), an environmental journalist, who suggested that, “when Durban pulled out of the international Blue Flag beach scheme recently, city officials raised concerns about ‘Eurocentric double standards’”. Providing justification for this position of the ‘defiance’ discourse, the Municipal discourse coalition posited that ‘Eurocentric’ criteria were not applicable in eThekweni because of the warmer sea water associated with the sub-tropical climate.

Further justifying the argument regarding the relevance of the water quality criteria for the local context of eThekweni, the Municipal discourse coalition expanded on the ‘relevance or suitability’ story line, suggesting that criteria, developed in the temperate climate of Europe, were not suitable in the warm seas characteristic of a sub-tropical climate. This assertion was supported by the fact that “there are no beaches in Australia and the US that have Blue Flag status ... [and that] we had to comply with European standards which suits Cape Town’s waters” (Macleod, cited in Fourie, 04/07/2012: 5). This argument is supported by a debate in the literature which suggests that the microbiological indicator organisms used by WHO, Blue Flag and the EU, namely, *E. Coli* and intestinal *Enterococci*, can survive for longer periods, and even thrive in warm, sub-tropical sea water (Shibata *et al.*, 2004). This debate was accepted by a number of participants as a justifiable concern that merited consideration, with one of the members of the Municipal discourse coalition insisting that,

“World Health [the World Health Organisation] itself will tell you those standards are quite old, they’re applicable to temperate zones, the studies are not complete as regards tropical and sub-tropical zones, so there’s a lot of discussion about whether they are suitable for tropical and sub-tropical zones” (Jackson, 16/10/2014).

Expanding on the unsuitability of the ‘Eurocentric’ BFP criteria for the local Durban context, the Municipal discourse coalition argued that the system was unsustainable in a developing world context because both WESSA and FEE adopted uncompromising positions regarding compliance with the criteria, which did not accommodate the issues encountered by a developing country, such as South Africa, with known sanitation issues and service delivery backlogs (Sutcliffe, 03/11/2014). Sutcliffe, further implied that while eThekweni had a number of its ‘Golden Mile’ beaches accredited by Blue Flag, he understood that “they were teetering Blue Flags, in the sense that we couldn’t achieve all of those [criteria] and we knew that it was

just a matter of time before a number of issues would emerge” (Sutcliffe, 03/11/2014). Further to this he argued that only a “few of the beaches in KZN would be able to comply with the Blue Flag in the next 10 years”. This position was supported by Jackson (16/10/2014), a member of the Municipal discourse coalition, who stated that in the Durban context “for us it is not sustainable ... to sustain that level for 365 days a year, I don’t think it’s sustainable”.

Datadin (17/10/2014) indicated that there had been discussions within FEE and Blue Flag regarding changing the water quality criteria for South Africa but it was agreed by these organisations that the water quality parameters were appropriate for all members, regardless of location. In support of maintaining existing BFP criteria and microbiological indicators, Breetzke (13/10/2014) argued that while concerns were justifiable, research suggests that the practical difference between temperate and sub-tropical climates is related to the bathing season overlapping with the rainy, summer season, and not with the behaviour of microbiological organisms under different temperatures. Weerts (28/10/2014) agreed with this, proposing that:

“one of the issues around Blue Flag, and we’re talking about warm waters compared to cooler waters ... is that Durban, and I guess other sub-tropical places, have a bit of a double whammy in that: a) they’ve got warmer water so you do have this issue of the indicator living longer and dispersing wider; but b) ... they’ve got ... all year swimming ... so their main beach season coincides with the highest [rainfall] run-offs”.

A number of other participants also adopted this argument, arguing that the eThekweni authorities should give consideration to managing their Blue Flag status by shortening the Blue Flag season so as not to coincide with the rainy season in which contamination probability is highest (Breetzke, 13/10/2014; Datadin, 17/10/2014; Respondent D, 17/10/2014).

“It’s a system of subjective application”

One of the arguments of the ‘defiance’ discourse is that the BFP is ‘subjectively applied’ in different contexts. It is proposed rather that the BFP should be an ‘all-or-nothing system’ and consistently applied. One of the reasons provided by the Municipal discourse coalition for rejecting the BFP was that “their [BFP] standards applied differently across countries in the world” (Sutcliffe, 03/11/2014) and was therefore too subjective. This argument was supported

by anecdotal evidence in the ‘defiance’ discourse about the way in which European countries selectively prohibit the presence of certain animals on the beach and also restrict their Blue Flag season to the months in which compliance with the water quality criteria of BFP are easier in order to ensure continued accreditation of their beaches (Sutcliffe, 03/11/2014).

The newspapers reporting on the Municipal discourse coalition story line of subjective and inconsistent application of criteria (Mbuyazi & Cole, 29/10/2010; Mbuyazi, 27/10/2010). Macleod (cited in Fourie, 04/07/2012: 5), insisted that “the quality of Durban’s sea water has nothing to do with Blue Flag status, and the failure of the city to apply for this accreditation is related to an inconsistency in testing standards [espoused by the BFP]”. Steenhuisen, a DA politician, employed an ‘argumentative rationality’ to highlight the discrediting tactic of the Municipal discourse coalition, especially Sutcliffe, stating that “it never ceases to amaze me the lengths to which Mike Sutcliffe will go in order to discredit those who oppose his narrow view of the world. The Blue Flag scheme ... is a case in point” (Steenhuisen, 21/05/2008). This statement provides insight into the party politics at play between the two main political parties in South Africa, namely the ANC, of which Michael Sutcliffe was a member, and the DA, the oppositional political party.

‘A financially unsustainable system’

The financial unsustainability of the BFP in the eThekweni context was an additional dimension of the ‘defiance’ discourse argued by the Municipal discourse coalition. Jackson (16/10/2014) claimed that “to achieve what they wanted us [eThekweni] to achieve would have been astronomically expensive”. Sutcliffe reiterated this argument in a report for the Municipality’s Executive Committee (EXCO), which reasoned that “the eThekweni Municipality would have to fork out over R30 million if it were to re-apply for Blue Flag status for its 38 ‘swimmable beaches’” (Mbanjwa, 14/04/2010), and that this was clearly ‘financially unsustainable’ on a long-term basis. According to Mbuyazi (27/10/2010: 3), the report said that:

“R20m would be needed to establish a separate Blue Flag department to co-ordinate and oversee the management system. A further R10m would also be required to fund the independent service provider for water testing and reporting, should the system be restored”.

Mather (30/09/2014), Municipal official and member of the BFP discourse coalition, disputes this figure, estimating that “it probably costs us R1 million to run the Blue Flag Programme ... there is a certain level of service we’ve got but the extra level of service to get to Blue Flag is probably costing us R1 million, which in the bigger scheme of things is small”. These differing ‘positions’ on the economic cost of reinstating and maintaining the BFP provide a clear example of the ‘argumentative discourses’ present in the environmental policy-making arena.

‘An apartheid system’

Based on the position that the BFP was an unsustainable beach management approach for eThekweni to adopt, Sutcliffe (03/11/2014) argued that, should eThekweni apply for accreditation at selected beaches only, it would essentially be creating two systems of beach management, a scenario which led him to use the politically charged discourse of ‘apartheid’ to describe the BFP.

Again, this position was reported on by newspaper journalists and placed within the public domain (Carnie, 16/05/2008; “True Blue Status,” 15/04/2010). Sutcliffe (cited in Carnie, 16/05/2008) argued, through the popular press, that “the Blue Flag team have, through their actions, created two categories of beaches, much like apartheid having black and white beaches”. During the interview conducted for this research, he reiterated this position arguing that this was not only his view but that it was supported by other members of the Municipal discourse coalition, including the Municipal Water and Sanitation Department:

“ ... our objection ... [and] the objection of [the] Water and Sanitation [Department], the objection of everyone is: are we creating two systems here? Are we creating an apartheid system, or are we creating a system for the city as a whole? Because if we start having two departments, one focused on Blue Flag and one focused on the rest of the city, because of these changing standards, and this is what the scientists were saying to me, you’re going to continually have this kind of problem there, and you’re going to continue, basically, to reinforce the apartheid system” (Sutcliffe, 03/11/2014).

Very few of the other participants used this argument. It can therefore be surmised that it was not a widely held view. However, as the politically mandated official in charge of managing eThekweni, there is inherent power in the Sutcliffe’s discourse which was transferred to the

Municipal discourse coalition. Breetzke's (13/10/2014) interpretation of the BFP as an apartheid system "was [that it was a] ridiculous [argument] because Blue Flag is an international thing [organisation] and they couldn't care less about our past politics". While this comment is insightful it does not address the core issue underlying the statement; that of a two-tiered approach to beach governance in eThekweni.

To further validate and justify the 'defiance' discourse, Sutcliffe (cited in De Boer, 14/03/2008: 3) insisted that the Municipal Programme of beach management was "more advanced than the Blue Flag anyway", which was Eurocentric, applicable for colder water, inconsistent and subjective, unsustainable, and an apartheid system.

'The Municipal Programme is more advanced than the Blue Flag anyway'

Continuing with the 'defiance' discourse, the Municipal discourse coalition insisted that, not only was the BFP an unsuitable approach to apply in eThekweni, but that the Municipal Programme put in place by eThekweni officials was "more advanced than the Blue Flag anyway" because their approach has been inconsistent and not developmental in its approach" (Sutcliffe cited in De Boer, 16/05/2008: 3). He further justified this claim, stating that "all our own analysis shows that our standards rate very highly with other Blue Flag beaches" (Sutcliffe, cited in Carnie, 16/05/2008: 1).

Evidence reveals that some participants were aware of the claim of Municipal superiority articulated by Sutcliffe and the Municipal discourse coalition. Breetzke (13/10/2014) stated that, "... they supposedly put in place their system which was now better than anyone's system. Mike was adamant he was going to sell the system to the rest of the world" Larmont (30/09/2014) provided a more cynical assessment of the claim of superiority: "... and isn't that the old political thing; if you don't like what you hear, cover it up and hide it and say we've got a better standard". From these two participant statements it can be inferred that some members of the BFP discourse coalition questioned the reasoning provided by eThekweni for its decision to withdraw from the BFP.

The 'defiance' discourse adopted by the Municipal discourse coalition in an attempt to promote a story line that questioned the relevance and applicability of the BFP for the African, South African, and local eThekweni context was a powerful discourse consisting of a number of sub-

themes or sub-discourses. It is argued that this discrediting campaign represented a shrewd political manoeuvre on the part of the Municipality as it sought to control the narrative and to influence public perceptions of the credibility and relevance of BFP criteria for eThekweni. This discourse argues against the BFP and in so doing gained potential support from eThekweni officials, political councillors, and civil society.

Running concurrently to the anti-BFP discourse was continued public and political support for the BFP. The next section presents the counter-discourses of ‘rejection’, ‘despair’ and ‘hope’ used by the BFP discourse coalition to express opposition to the Municipal decision to withdraw from the BFP.

6.3.4 Phase 2: The counter-discourses of ‘rejection, despair and hope’

In the struggle to control the narrative around the BFP a counter-discourse was developed by Blue Flag SA, the public, and some political figures and organisations within eThekweni which questioned the Municipal decision to withdraw from the BFP. These actors formed a discourse coalition as illustrated in Figure 6.1 and 6.2. The story line and positions adopted by this discourse coalition were expressed through discourses of ‘rejection, despair, and hope’.

Analysis of the interview data reveals that many participants were aware of the political support that existed for the BFP. Datadin (17/10/2014), an employee of Blue Flag SA, said that there was a lot of political support for the programme from a provincial level in KZN. The provincial pressure and support originated from both the tourism and environmental branches of KZN EDTEA and also from the Federated Hospitality Association of South Africa (FEDHASA) (Respondent B, 09/10/2014). Political support emanated from provincial level as well as from national and municipal levels. Kelly (01/11/2014) stated that “there was a lot of behind-the-scenes pressure for the eThekweni Municipality to engage with the Blue Flag Programme, from the DA, the province, tourism departments, FEDHASA etc.”. Breetzke (13/10/2014) also referred to the diverse array of governmental departments supporting the programme which were applying pressure on eThekweni to re-join the BFP:

“... we’ve always had various national departments on our side and I was part of it. ... SALGA [South African Local Government Association] was one of them that feel very strongly about it ... and then you had the economic development guys, you had the tourism guys, you had everyone pushing and

eventually it paid off. They got through to the economic development guys here in KZN ... And because of that, because of the push, they then pushed on the new municipal manager ... And it's come down from [the provincial] economic development, well from that department really. And on the tourism side as well, so from the national tourism ministry as well ... national and local, both of them have put pressure”.

Mather (30/09/2014), the eThekweni Municipality Coastal Policy Executive also noted that there was pressure being applied on eThekweni to re-join the BFPP from provincial government:

“... there's a political issue there; we're the only municipality that was adamant we were out of that programme. I've been to meetings where the top guys in province ... have been critical of eThekweni, saying you're the only municipality from the province that isn't on board, you guys better get on board”.

Evidence shows that there were vocal supporters of the BFP who questioned the decision of the Municipality to withdraw from the BFP and also the credibility of the alternative Municipal Programme (Larmont, 30/09/2014; Pullan, 03/10/2014). Pullan, in a letter to the Daily News Newspaper, further hinted at the despair he felt when eThekweni withdrew, especially after being the first coastal municipality in South Africa to join the international accreditation scheme, suggesting that “it seems tragic to have spent so much time and effort on this only to give it up” (Pullan cited in De Boer, 20/06/2008: 3). This feeling of despair at losing accreditation was echoed by Cole (01/07/2008: 2), who noted that “while city manager Michael Sutcliffe could not be reached for comment last night, it appears that appeals to him to reconsider restoring Durban's beaches to Blue Flag status have fallen on deaf ears”. Jackson (16/10/2014), who was part of the dominant Municipal discourse coalition was also aware of the political support for the BFP and the pressure for eThekweni to re-join, particularly from the provincial government and DA councillors in eThekweni.

Evidence also shows that the media were reporting on the counter-discourse of ‘rejection and despair’ and that there was significant public and governmental support for the BFP, despair at losing accreditation, and hope that eThekweni would re-join the BFP. Opposition political parties such as the DA and Minority Front (MF), were very vocal in their support in the media, with one MF councillor, Patrick Pillay asserting that the “loud cry of the community in support

of Blue Flag beaches” must be heard (cited in Savides, 01/11/2009: 5). The vocal rejection by opposition political party representatives of the ANC-run eThekweni Municipality illustrates the party politics at play and how these politics attempted to influence public perception regarding the BFP and eThekweni’s decision to withdraw from it.

Newspaper journalists also highlighted the level of support at a national governmental level, with Carnie (16/10/2008: 3) reporting that the Deputy Minister of the National Department for Environmental Affairs and Tourism (DEAT), Rejoice Mabudafhasi, chided eThekweni officials “over the city’s loss of several Blue Flag beaches, and recent litter problems on the beachfront”, suggesting that “with the 2010 Soccer World Cup in mind, a focal point will be to ensure clean beaches and to manage litter, wastewater and storm water carefully to avoid contamination”.

The National Tourism Minister, Martinus van Schalkwyk, and the then-provincial tourism Member of the Executive Council (MEC) Weziwe Thusi, also added voices to the calls for eThekweni to re-join the BFP as it was a tourism drawcard and would benefit the city and the country (Carnie, 30/04/2008; Padayachee, 29/06/2010; Savides, 01/11/2009). The economic benefits of the BFP were alluded to by the current KZN EDTEA MEC, Mike Mabuyakhulu (cited in Attwood, 25/04/2010: 3) who insisted that “reinstating the system would boost tourism revenue”. Other newspaper articles also reported on this statement (Mbanjwa, 14/04/2010), indicating that the rejection of the Municipality’s decision was publicised with the intention of providing clarity for the public regarding credibility and authority of the BFP (Respondent D, 17/10/2014).

Continued public support for the BFP eventually resulted in a final shift in the discursive landscape in eThekweni. This shift was characterised by a willingness, on the part of eThekweni, to rethink the decision to withdraw and is expressed through a discourse of ‘conciliation’.

6.3.5 Phase 3: The ‘conciliation’ discourse and ‘a willingness to rethink’

Following a sustained campaign of support from government, the public, and politicians alike, for a period of approximately six years, the discursive landscape of the environmental policy arena surrounding eThekweni’s involvement with the BFP underwent a final transition. This

transition was expressed through a discourse of ‘conciliation’ characterised by a ‘willingness to rethink’ the Municipal decision to withdraw from the BFP, representing a vital transition that enabled eThekweni to re-join the BFP in the 2013/ 2014 season.

A number of interview participants suggested that a discourse of ‘conciliation’ was only realised with a change in leadership, both within the Municipality and also within WESSA (Breetzke, 13/10/2014; Mather, 30/09/2014; Respondent 09/10/2014). This is in reference to the departure of Alison Kelly as coordinator of the South African BFP on 31 January 2011 (Kelly, email, 09/06/2015), and Michael Sutcliffe as Municipal Manager on 3 January 2012 (Office of the City Manager, n.d). It became apparent that new leadership both in the Municipality and WESSA was more receptive to the BFP than previous leadership had been, enabling the relationship between these two organisations to be rebuilt (Datadin, 17/10/2014). Data collected from newspaper articles confirms these sentiments, indicating that they were also publicised in the popular press (Naidoo, 23/01/2012). A willingness to rethink the Municipal decision to withdraw from the BFP was expressed by the new Municipal Manager Sibusiso Sithole, who indicated that there was pressure to re-join from the tourism industry and therefore he was willing to “review eThekweni’s position on the matter” (Naidoo, 23/01/2012: 1). Providing justification for his willingness to review the decision, Sithole (cited in Harris, 21/12/2012: 35), indicated that “if the Blue Flag is accepted by the tourism industry as a way to add weight to a marketing decision, I see no reason why we should not be part of the programme”.

Deputy Mayor, Logie Naidoo, was quoted in the popular press expressing a similar view that the Municipal decision to withdraw could now be rethought: “a dispute had arisen because of how the Blue Flags were being administered differently in different places. But the time is now right to get Blue Flag status and it would be a boost to have it back” (Naidoo, cited in Padayachee, 29/06/2010: 1). Sutcliffe (03/11/2014), while not rebuking claims that a change in leadership had facilitated re-entry into the BFP, provided a more cynical assessment of the decision to re-join, proposing that “the only reason the city probably went for something like that now, is not because it is an international benchmark, it just avoids the negative publicity because you have a media who really don’t know the issues”. According to some participants, the position which “had been adopted by the Municipal Manager ... couldn’t be shifted. He had been too outspoken in his condemnation of it [the BFP]. He couldn’t turn back” (Kelly,

01/11/2014), and Sutcliffe's comments above should therefore be viewed in light of this suggestion.

6.3.6 Phase 4: 'Political support and advocacy' discourse

By June 2013 the expression of political support for the decision by eThekweni to re-join the BFP was too loud to resist: "I think they all [ANC councillors] realised that from a reputational point of view [that] Durban needs to be in the Blue Flag Programme. So from a councillors' point of view, that's why they all basically agreed with the DA" (Mather, 30/09/2014). This was confirmed by Municipal employee Chrystal (07/10/2014), who indicated that everyone within the Municipality was generally in favour of regaining Blue Flag status for eThekweni's beaches, and DA councillor, Geoff Pullan (03/10/2014), who insisted "that it was no longer the DA pushing the Blue Flag agenda but the province, which was controlled by the ANC". Even former Municipal manager, Michael Sutcliffe, under whose watch the decision to withdraw from the programme was taken, expressed support for the political decision to re-join: "I welcome mayor James Nxumalo's programmatic re-introduction of some of our beaches with a view to ensuring all beaches become part of that programme" (Sutcliffe, cited in Aberdeen, 14/06/2013: 3). It is assumed that Sutcliffe's support for the decision to re-join was conditional on eThekweni adopting an 'all-or-nothing' stance towards BFP.

There had been some lessons however and Mather (30/09/2014), indicated that eThekweni had intentionally sought to keep re-entry to the BFP out of the public domain in order to avoid repeating the negative publicity that accompanied the decision to withdraw.

The discussion now turns towards understanding relationships between political contestation over the BFP and the evolution of a discourse in relation to what constituted a credible knowledge base for beach management.

6.4 Knowledge production and contestation

6.4.1 Introduction

This section assesses how the Municipal and Blue Flag approaches to sea water quality monitoring can be categorised according to Callon's (1999) models of knowledge production. Processes of knowledge production and knowledge contestation lie at the heart of this research.

In Durban, knowledge constituting the core of the BFP approach was contested by the Municipal discourse coalition, while the knowledge base of the Municipal Programme was likewise contested by actors from Durban's public, private, and political spheres who were part of the BFP discourse coalition.

As discussed in the literature review in Chapter Two, Callon (1999) proposes three models whereby knowledge is produced and taken into policy. Each model can be conceptualised as lying along a continuum that indicates an increasingly inclusive process of knowledge production and negotiation that involves actors who hold a variety of different knowledge types. The first of these is the Public Education Model (PEM) which assumes that a public deficit of knowledge can only be overcome through an expert-led process that aims to educate the public. This model is characterised by top-down governance. The second model is the Public Debate Model (PDM) which assumes the dominance of scientific knowledge but is premised on the understanding that public knowledge may be lacking and there is therefore a need to include public knowledge in decision-making processes in order to ensure the sustainability of the outcome. Participatory governance techniques embody this principle. The final model is the Co-production of Knowledge Model (CKM) which argues for the inclusion of all actors who might have relevant knowledge regarding the particular topic of the decision-making process, irrespective of the type of knowledge held. Inclusive governance approaches that seek to include multiple actors in decision-making, epitomise this model. For other authors, a distinction is made between the types of knowledge which can be produced either under mode 1 or mode 2 processes (Gibbons, *et al.*, 1994; Lane *et al.*, 2010; Nowotny *et al.*, 2003; Whatmore, 2009). Here, mode 2 knowledge is aligned with Callon's (1999) CKM because it is inclusive in its acceptance of a variety of knowledge types into the knowledge production process.

In this study, it is difficult to differentiate between the two beach management approaches employed by eThekweni because neither approach displays the hallmarks of a truly inclusive process in which knowledge has been co-produced by multiple knowledge holders. Rather, both approaches are products of similar, expert-led processes, in which the public has for the most part, been excluded. However, this does not mean to say that engagement with knowledge production processes has been static. Indeed, the discursive space in which these approaches were debated has been shown to be a fluid space in which actors in the different discourse coalitions have politically argued their perspective in a public arena through the media. The

previous section identified four transformative phases in which the discursive landscape changed, illustrated in Figure 6.2. This section assesses transformations that have occurred in the knowledge production processes relating to beach management in eThekweni. It is proposed that the political issue of the BFP policy in Durban was a ‘drama’ in Durban which unfolded in four phases of knowledge production and contestation (Hajer, 2005) (Fig.6.5). It is proposed that each of these phases is closely aligned with the discursive phases presented in Figure 6.2.

These phases are now explored with a view to understanding the points at which the debate around beach management in Durban and eThekweni exhibited characteristics associated with Callon’s (1999) models of knowledge production.

6.4.2 Phase 1: Uncontested meta-narrative of beach management (Blue Flag Programme status quo)

As mentioned in the previous section, the initial decision for eThekweni to join the BFP, and to apply for and receive accreditation for Durban’s ‘Golden Mile’ beaches, achieved broad spectrum consensus from private and public sectors of Durban society and was widely applauded. Discourses of ‘political advocacy and support’ were used by the public, business, and governmental departments at all three levels, including eThekweni Municipal officials who “were certainly great advocates” (Sutcliffe, 03/11/2014). The evidence reveals that eThekweni enthusiastically bought into the Blue Flag approach because it was understood to be a credible beach management approach with a scientific base (Breetzke, 13/10/2014; Kelly, 01/11/2014; Packree 23/10/2006; Metro Reporter 29/10/2004). Indeed, owing to its perceived credibility, eThekweni embarked on an expansion of the approach, seeking and gaining accreditation for a number of additional ‘Golden Mile’ beaches between 2003 and 2006 (Mather, 30/09/2014) (Fig. 3.4).

Broad spectrum consensus regarding the credibility of the BFP, based on scientific criteria, and the recognition of excellence conferred on eThekweni regarding beach management, emanated from all corners of South African government and society. Public engagement and contestation of the BFP’s knowledge base was absent because unequivocal support led to a lack of critical engagement with the knowledge base. The relatively low level of publicity characteristic of

this phase is evidenced by the somewhat sparse number of newspaper articles addressing this topic up until 2007 (Fig. 6.5).

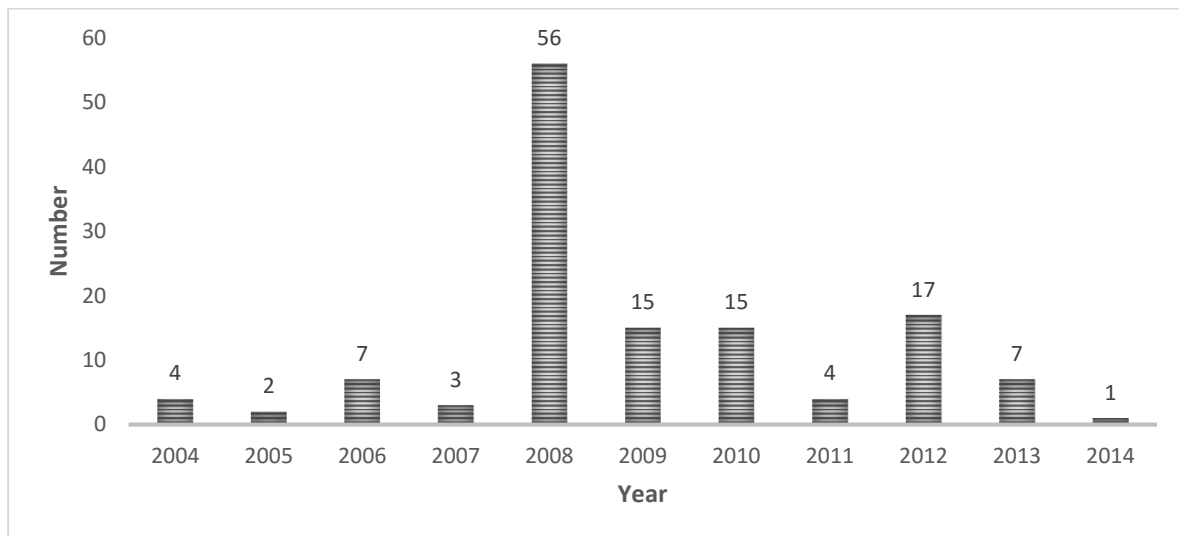


Figure 6.4. Number of newspaper articles written on the Blue Flag Programme in Durban over the period 2004 to 2014

This demonstrates the perceived credibility and superiority of the BFP as a beach management approach and general acceptance of the system of beach management and its underlying scientific knowledge base. Thus, this phase in Durban's involvement with the BFP can be likened to the PEM knowledge production because of the endorsement of scientific knowledge regarding the measurement of water quality and the exclusion of all tacit knowledge inputs (Callon, 1999). The absence of public participation and engagement, a central tenet of the PEM (Lane *et al.*, 2010; Nowotny *et al.*, 2003; Whatmore, 2009) is demonstrated by the expert knowledge inherent in the BFP and its lack of public input. This phase therefore represents a period of restricted public and political engagement in eThekweni in relation to beach management generally, and the BFP specifically.

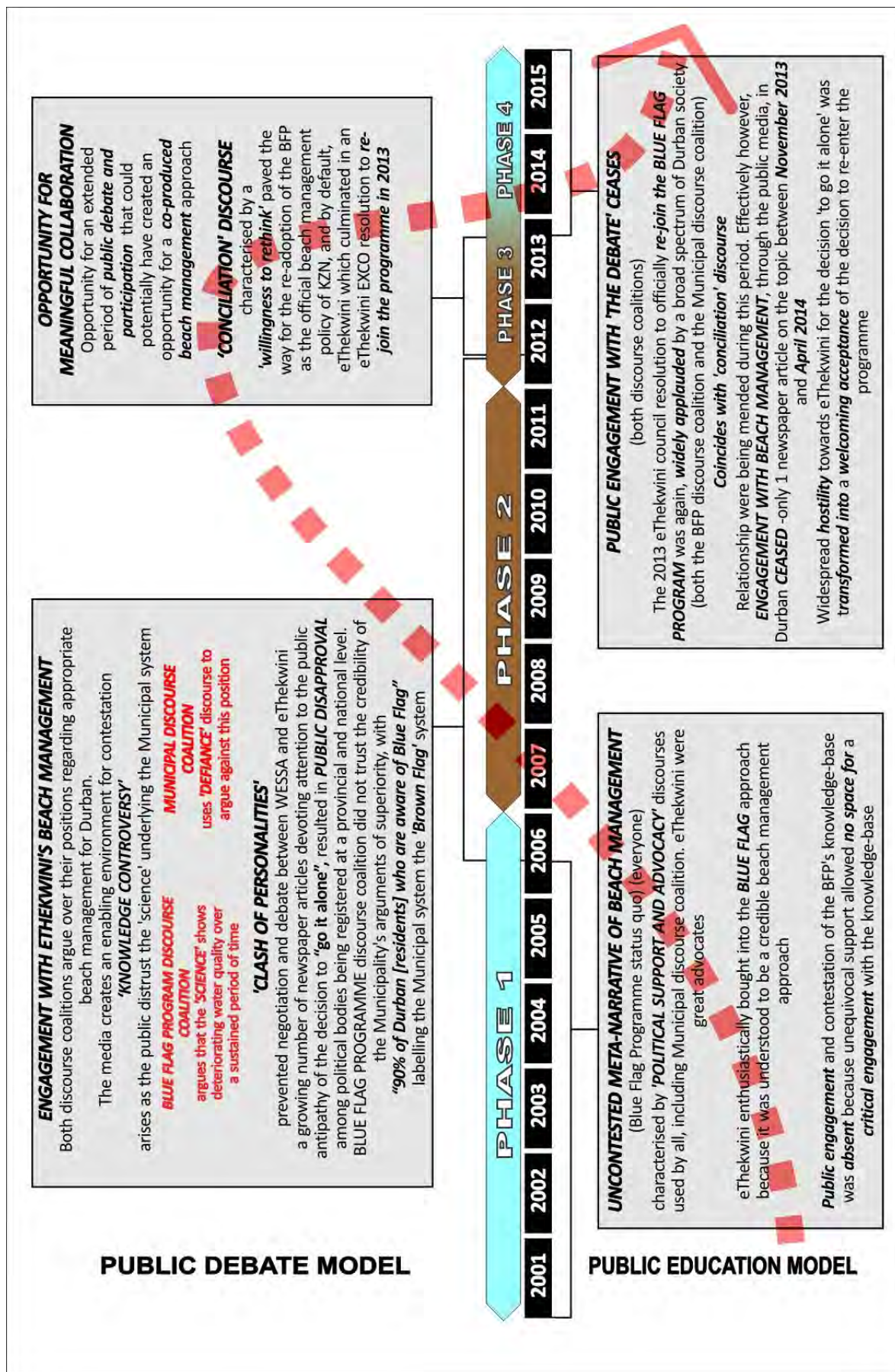


Figure 6.5. Phases of knowledge production/ contestation

This figure shows four phases of knowledge production: ‘Uncontested meta-narrative of beach management’; ‘Engagement with eThekweni’s beach management approaches’; ‘Opportunity for meaningful collaboration’; and ‘Public engagement with the debate ceases’. Beach management is presented as a ‘knowledge controversy’ (Whatmore, 2009). Figure 6.5 shows the shift from, PEM as the underlying knowledge production mode of beach management in Phases 1 and 4, and PDM in Phases 2 and 3. The arrow indicates the shift in the underlying knowledge over time (2001 – 2015).

6.4.3 Phase 2: Engagement with eThekweni’s beach management approaches

From 2006 to 2008, eThekweni began experiencing difficulties complying with BFP criteria, especially those focused on water quality. Engagement with the BFP’s knowledge base (Fig. 5.1) began to receive increasing publicity in the popular press (Carnie, 01/10/2014; De Boer, 20/11/2007; Jones, 23/09/2014; Larmont, 30/09/2014; Pillay, 27/11/2006; Robertson, 30/11/2006). This period of engagement created conceptual space for the public to engage with eThekweni’s beach management approaches. According to Kelly (01/11/2014), there had been a long-term deterioration in eThekweni’s sea water, with WESSA and eThekweni “watching the water quality deteriorate ... over probably, I would say, at least an 18 month period, probably longer than that”. Mounting public attention was directed at eThekweni’s perceived inability to adequately manage the water quality of its beaches, particularly those on Durban’s ‘Golden Mile. In response, from 2007 to 2012, eThekweni publicly adopted the ‘defiance’ discourse discussed in the previous section, which sought to publicly discredit the BFP’s management objectives and scientific knowledge base. The ‘defiance’ discourse was adopted by the Municipal discourse coalition prior to the decision to withdraw from the BFP and instate the alternative Municipal Programme and continued to be used to defend the Municipal Programme as an alternative form of scientific approach throughout the period of its implementation.

As the issue of falling water quality standards continued to receive increasingly negative publicity, there was mounting criticism of eThekweni by WESSA and the public. The debate intensified, and became personalised with Sutcliffe and Kelly engaging one other in the public domain via the popular press (Carnie, 25/03/2008, 27/03/2008; Padayachee, 29/06/2010; Sanpath, 25/03/2008). A number of interview participants felt there had been a ‘clash of personalities’ (Breetzke, 13/10/2014; Kelly, 01/11/2014; Mather, 30/09/2014; Pullan,

03/10/2014; Respondent A, 09/10/2014; Respondent B, 09/10/2014) which essentially prevented negotiation and debate between WESSA and eThekweni.

Evidence shows that public perception of the Municipal Programme was that it was inadequate and that it “aroused suspicion amongst the public that it wasn’t so much an issue of whether the standards were relevant or not but that Durban previously had Blue Flags and they were now being withdrawn and this was an indicator that the quality of the sea water has deteriorated” (Carnie, 01/10/2014). Weerts’ (28/10/2014) suggested that the Municipal Programme was called the ‘Brown Flag system’ “for 90% of Durban [residents] who are aware of Blue Flag”. This is a damning indictment of public perception of the Municipal Programme, seen by many as political spin deflecting attention from eThekweni’s poor beach management. The public perception epitomises the concept of a ‘knowledge controversy’ in which the public rejects the expert knowledge upon which decisions and policies are made (Whatmore, 2009).

Thus, the ‘knowledge controversy’ of eThekweni’s wholesale rejection of the BFP and its decision to “go it alone” (Carnie, 25/03/2008: 3) effectively created a space, in the media, for public engagement with the debate around the knowledge base of the BFP. Although it was not a formal process of public participation, the media provided an ‘informal space’ for the public to exert pressure and engage indirectly in the decision-making arena. In turn this also led to public engagement over other possible beach management approaches, including the Municipal Programme. Moreover, the space also created the possibility for increased awareness of the power held by the public to exert pressure that could influence political decision-making, evidenced by the number of Durban citizens who expressed an opinion on the Blue Flag debate in the popular press (“Cooler hand, Mike,” 27/10/2009; Harper, 11/10/2009; Macpherson, 19/05/2008; McCarthy, 29/05/2008; Morgan, 10/11/2008a, 10/11/2008b). It is therefore suggested that this phase (2001-2006) of the debate around Durban’s Blue Flag future most closely resembles Callon’s (1999) PDM, in which the public is invited to contribute to decision- and policy-making through public participation processes. Increased levels of public debate are substantiated by the growing number of newspaper articles devoting attention to public antipathy of the decision to “go it alone”, and which resulted in public disapproval among political bodies being registered at a provincial and also national level (Fig. 6.4).

6.4.4 Phase 3: Opportunity for meaningful collaboration

It may be argued that at this juncture in the public engagement, there existed the opportunity for an extended period of public debate and participation that could potentially have created an opportunity for a co-produced beach management approach. Had eThekwini seen the public reaction to both its decision-making and the establishment of the Municipal Programme as a knowledge controversy, they could possibly have set up a formal participation process aimed at placating growing public dissatisfaction. This could potentially have enabled robust debate to continue and facilitated a process of knowledge production and negotiation that resembled the CKM model. However, political involvement from provincial and national government, manifest in public announcements via the popular press (Attwood, 25/04/2010; Mbanjwa, 14/04/2010; Mbonambi, 10/12/2012), effectively halted progression towards such a collaborative environment by pacifying the public and thereby thwarting the pressure placed on the Municipality regarding its decision-making. Furthermore, a change in leadership at WESSA (January 2011) and eThekwini (January 2012) enabled the adoption of a ‘conciliation’ discourse, epitomised by a ‘willingness to rethink’ the decision to ‘go it alone’, which paved the way for the re-adoption of the BFP as the official beach management policy for KwaZulu-Natal and by default, eThekwini (KZN DEDT, 2011). The political pressure from provincial government culminated in an eThekwini Council resolution to reinstate the BFP in 2013 (Mather, email, 20/10/2014; Pullan, 03/10/2014).

6.4.5 Phase 4: Public engagement with ‘the debate’ ceases

The 2013 eThekwini council resolution to officially re-join the BFP and re-apply for pilot status for four municipal beaches, namely, eMdloti Tidal beach, eMdloti Main Beach, uShaka Beach and uMgababa Beach, was again, widely applauded by a broad spectrum of Durban society, including both the Municipal and BFP discourse coalitions. The ‘conciliatory’ position reached when eThekwini agreed to re-adopt the BFP, helped to rebuild damaged relationships. Relationships between WESSA, eThekwini and the public had broken down over the course of the ‘knowledge controversy’ and now needed to be re-established. This is corroborated by the assertion of Datadin (17/10/2014) that “a good working relationship is being rebuilt” and Respondent D (17/10/2014) felt that the public mistrust of the eThekwini council and the damaged relationship between WESSA and eThekwini was now being mended. New leadership at WESSA and eThekwini has allowed a platform for a new alliance, but the relationship is a fragile one. Effectively however, engagement with beach management through

the public media in Durban ceased, evidenced by only one newspaper article (Fig. 6.5) referring to beach water quality management in Durban, being written over a five month period between November 2013 and April 2014 (Jansen, 09/10/2014).

The wholesale ‘buy-in’ from eThekwin, the public, tourism bodies, and local political parties to adopt the BFP resulted in a closing down of the environment for engagement. Widespread hostility towards eThekwin for the decision ‘to go it alone’ was transformed into a welcoming acceptance of the decision to re-enter the programme. This ended the knowledge controversy. Respondent D (17/10/2014), suggested that the reason for the perceived transition from hostility to welcoming acceptance was because most Durban residents, when asked, would probably say they wanted Durban to be in the programme. He further substantiated this assertion by arguing that,

“I think also what has been in eThekwin’s favour is that once eThekwin dropped out of the programme, you didn’t have a situation whereby the public are saying, well, you know, screw Blue Flag, we will still ... They were a bit aggrieved regarding eThekwin not being part of Blue Flag.”

Regardless of whether or not individual voices were publicly articulated, there is a strong sense among the respondents that they have been represented and heard, thereby removing any conflict around the debate.

6.5 Conclusion

In July 2008 the eThekwin Municipality shifted policies toward beach water quality and monitoring and management thereof, from 2008 to 2013. This saw a move away from an internationally accredited system with a holistic range of considerations and which was independently and scientifically audited, towards a narrower, in-house management system focused on water quality only. Both systems are based on expert scientific knowledge.

Political contestation was evident in the counter-discourse coalition that supported the BFP was formed in the enabling environment created in the popular press which facilitated the establishment of a shared understanding. This coalition used a discourse informed by experiential and technical knowledge to argue for alternative understandings of what constituted good beach management, and the move away from BFP was widely viewed in a

negative light. This was in spite of both beach management approaches being focused around beach user health and safety.

The discourses used by a variety of knowledge holders allowed participation in the debate around the BFP through discourse coalitions that adopted story lines in order to position themselves within the debate and argue for their particular viewpoint. The discourses used were the ‘political support and advocacy’ discourse, the ‘defiance’ discourse, the ‘rejection, despair and hope’ discourse, and the ‘conciliation’ discourse which are depicted in Figure 6.2. The fluidity of the debate was enabled by an ‘argumentative rationality’ that saw the engagement evolve together with knowledge holders’ positions.

Neither the BFP, nor the alternative Municipal Programme of beach management can be considered the product of the CKM model because neither incorporated social knowledge into their knowledge base. Both approaches were underpinned by expert scientific knowledge. However, the media created an informal space in which the public engaged with each other and debated how the knowledge of beach management was used within eThekweni Municipality. This added political pressure which influenced both the debate and its outcomes and resulted in shifts in the manner in which actors engaged with one another. In phases 1 and 2, the predominant manner of engagement was through Callon’s (1999) PEM model as the public accepted the scientific knowledge base of the BFP. As the political debate intensified during phases 3 and 4, the PDM model of engagement was more evident.

There is a sense that the ‘knowledge controversy’ kept the debate alive but that the resolution around the debate which resulted in eThekweni re-adopting the BFP as the official beach management approach, ended engagement with the debate. All actors accepted the management imperatives of the BFP. It is posited that public debate would have stayed alive longer had the knowledge controversy not ended so abruptly, thus enabling continued robust engagement and possibly resulting in a formal process to co-produce knowledge.

CHAPTER 7

CONCLUSION

This research focuses on environmental decision- and policy-making in relation to beach water quality management in eThekweni over the period 2002 to 2014 when decisions were taken to employ two distinctive beach management approaches, namely the Blue Flag Programme (BFP) and the in-house, Municipal Programme. Both approaches attempted to control faecal contamination of beach water to within healthy limits for human recreation. Public and official criticism of the decision to abandon the BFP in favour of an alternate, local system, gave rise to the politicisation of the issue and the intense contestation of the stance towards the underlying knowledge that informed these changing policy decisions. The aim of the research is to understand this politicisation and contestation in relation to eThekweni Municipality's changing policies of beach water quality monitoring and management and the underlying knowledge upon which these policies are based. To achieve this aim, four objectives have been set, namely:

1. To explore understandings of water quality held by a wide range of knowledge holders;
2. To explore the knowledge that forms the basis of the two different water quality management approaches employed by the municipality and understand how this knowledge is used;
3. To explore the role played by politics in relation to the adoption of these different management approaches within eThekweni Municipality; and
4. To assess which of Callon's (1999) three models of knowledge production is most applicable to each of the water quality management approaches adopted by the eThekweni Municipality.

A qualitative methodology is adopted in this thesis which assumes that meaning is socially constructed and can be understood through language. Since the objective of the thesis is to understand different meanings of water quality and the varying understandings of the knowledge base of the two beach water management approaches, the main sources of primary data were gathered through interviews with a range of knowledge holders. Seventeen people were interviewed using a semi-structured interview schedule. This was supplemented by a

sample of newspaper articles from 2004 to 2014 that reported the views and understandings of various parties, as politicisation of the BFP escalated. Participants were purposively sampled and ranged from Municipal officials to beach users. The data was analysed to reveal a series of themes surrounding the ‘knowledge controversy’ of how to manage Durban’s ‘Golden Mile’ beaches. Furthermore, discourse analysis served as a tool to determine the ‘pattern of meaning’ in the evidence.

The literature review focuses on different modes of producing knowledge and how the relationship between science and society in the ‘network society’ is characterised by complexity arising from interconnectedness which demands inclusion of a wide array of knowledge inputs in order to arrive at robust and sustainable decisions or policies (Gibbons *et al.*, 1994; Lane *et al.*, 2010; Nowotny *et al.*, 2003; Whatmore, 2009). Literature suggests that mode 2 knowledge production has broadened to include many types of knowledge in response to increasingly complex problems faced by contemporary society. Environmental difficulties are typified by high levels of complexity which creates the impetus for including knowledge inputs from those outside the scientific domain. Callon (1999) proposes that the ideals of mode 2 knowledge are embodied in the co-knowledge production model (CKM). Proponents of both CKM and mode 2 knowledge, critique the orthodox reliance on science as the sole provider of knowledge for decision-and policy-making and give equal weight to different knowledge types (Gibbons, *et al.*, 1994).

The socio-economic context that facilitates restructuring of society along increasingly networked lines, has also created conditions in which knowledge is commodified and traded in the ‘network’ society. While this commodification has, in some instances, reinforced the orthodox hegemony of scientific knowledge, research on knowledge formation and knowledge production processes, critiques this hegemony and promotes broader inclusion of knowledge, thereby extending the base from which complex decisions can be considered.

‘Knowledge controversies’ are said to occur when there is mistrust in the adequacy and robustness of the scientific knowledge upon which policy solutions are founded. In a more connected and networked space, knowledge holders from outside of the scientific community are credited with possessing the means to organise and ‘position’ themselves in a public approach that can apply significant political pressure to the adoption of scientific knowledge in policy. Within the realm of environmental politics, knowledge holders engage one another

through the adoption of environmental discourses which are used to argumentatively interpret environmental information and move towards common understandings to be shared by a potentially diverse range of knowledge holders. The discourses furthermore, are used to politically support a particular course of action or policy in order to attempt to influence the outcome.

A variety of environmental discourses were adopted by knowledge holders as they gained a deeper understanding of the unfolding knowledge controversy surrounding the BFP in Durban, a city characterised by a sub-tropical climate and which is actively marketed as a beach tourism destination. As a tourism eco-label, the Blue Flag is a useful management tool in the arsenal of coastal city tourism managers, and the eThekweni Municipality's decision to withdraw all of eThekweni's beaches, including Durban's 'Golden Mile' beaches, from the BFP, was widely rejected and critiqued. The BFP is commonly regarded as a holistic programme with international credibility and a politically independent auditing system. Motivations for the withdrawal from the programme in favour of an in-house, self-sufficient monitoring system with a narrow water quality focus, were received with mistrust by a broad spectrum of the Durban public. There was outright rejection of attempts by the discourse coalition of Municipal officials, led by the then Municipal Manager, Sutcliffe, to invoke codified and embedded scientific knowledge of the microbiological properties of beach water as a justification for the change in water monitoring policy.

The evidence shows that in escalating attempts to sway the public, the eThekweni Municipality invoked discourses of 'Eurocentrism' and linked the BFP to the apartheid system of governance. Advocacy attempts also included the notion that the BFP was unsustainable and not suited to the warmer Durban climes while the Municipal Programme of monitoring beach water quality was mooted as a more advanced management tool. The public remained unconvinced and a number of themes became evident in their responses. Experiential knowledge holders cited 'visual and olfactory' cues; the sea water was believed to cause illness. Discourses of 'rejection and despair' began to circulate. The 'clash of personalities' between Sutcliffe and Kelly, as alluded to by a number of interview participants, and the high levels of public discontent evidenced in newspapers, are testament to the intense focus placed on the individuals at the centre of the debate.

Mistrust of the Municipality and of Sutcliffe created a ‘knowledge controversy’ wherein the decision to withdraw all eThekweni beaches from the BFP, was challenged. Mounting public pressure, invoking a number of environmental discourses, saw the eThekweni Municipality capitulate and reinstate the BFP. The environmental discourses used by the BFP discourse coalition took the form of a sustained promotion of the BFP knowledge base through a discourse of ‘political support and advocacy’ for the approach. The BFP coalition also used a counter-discourse of ‘rejection, despair and hope’ to argue against the credibility of the Municipal discourse coalition’s ‘defiance’ discourse, which was used to discredit the BFP knowledge base as a means of promoting the Municipal Programme’s underpinning knowledge. These rival discourses were the primary discourses through which the opposing coalitions were able to exert political pressure on one another in attempt to influence the outcome of the debate.

It is clear from the study that political contestation inherent in the Blue Flag drama in eThekweni demonstrates the newly realised political power of the public. In the context of the study, public pressure was shown to have a potential impact on decision- and policy-makers, albeit occurring in the ‘space’ created by the media. Through this process, public mistrust of the city authorities damaged relationships that then needed to be rebuilt in order to find a collective way forward. . However, in so doing, resolution of the debate foreclosed on the potential for true collaboration of knowledge production, thus circumventing the CKM model referred to by Callon (1999). More deliberative processes should aim to include the broadest range possible of knowledge holders in decision-making processes related to beach water quality management, in order to encourage robust debate and be truly inclusive.

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8. Kelly, A. Former National Coordinator of South African Blue Flag Programme (WESSA), 01/11/2014.
9. Larmont, M. Larmont Surf, Owner, 30/09/2014.
10. Mather, A. eThekweni Municipality, Project Executive: Coastal Policy, 30/09/2014.
11. Pullan, G. eThekweni Municipality, Democratic Alliance (DA) Councillor, 03/10/2014.
12. Respondent A. CSIR, 09/10/2014.
13. Respondent B, eThekweni Municipality, 09/10/2011.
14. Respondent C. CSIR, 09/10/2014.
15. Respondent D. KZN Department of Economic Development, Tourism & Environmental Affairs, 17/10/2014.

16. Sutcliffe, M. City Insight (former eThekweni Municipal Manager, 03/11/2014.
17. Weerts, S. CSIR: Senior scientist, Coastal Systems Research Group, 28/10/2014

PERSONAL COMMUNICATION

1. Bux, 03/09/2014. Personal communication (email). Re: *(no subject)*.
2. Kelly, A. 09/06/2015. Personal communication (email). Re: *Blue Flag Programme*.
3. Mather, A. 20/10/2014. Personal communication (email). Re: *Blue Flag question*.

APPENDICES

Appendix A: Blue Flag Programme criteria for 2014/ 2015 season (FEE, 2014)

Environmental education and awareness	
1	Information about the Blue Flag Programme and other FEE eco-labels must be displayed (imperative for all regions)
2	Environmental education activities must be offered and promoted to beach users (imperative for all regions)
3	Information about bathing water quality must be displayed (imperative for all regions)
4	Information relating to local eco-systems and environmental phenomena must be displayed (imperative for all regions)
5	A map of the beach indicating different facilities must be displayed (imperative for all regions)
6	A code of conduct that reflects appropriate laws governing the use of the beach and surrounding areas must be displayed (imperative for all regions)
Environmental management	
7	The local authority/ beach operator should establish a beach management committee (guideline for all regions)
8	The local authority/ beach operator must comply with all regulations affecting the location and operation of the beach (imperative for all regions)
9	Sensitive area management (imperative for all regions)
10	The beach must be clean (imperative for all regions)
11	Algae vegetation or natural debris should be left on the beach (imperative for all regions)
12	Waste disposal bins/containers must be available at the beach in adequate numbers and they must be regularly maintained (imperative for all regions)
13	Facilities for the separation of recyclable waste materials should be available at the beach (imperative for all regions)
14	An adequate number of toilet or restroom facilities must be provided (imperative for all regions)
15	The toilet or restroom facilities must be kept clean (imperative for all regions) (imperative for all regions)
16	The toilet or restroom facilities must have controlled sewage disposal (imperative for all regions)
17	On the beach there will be no unauthorised camping or driving and no dumping (imperative for all regions)
18	Access to the beach by dogs and other domestic animals must be strictly controlled (imperative for all regions)

19	All buildings and beach equipment must be properly maintained (imperative for all regions)
20	Marine and freshwater sensitive habitats (such as Coral reefs or sea grass beds) in the vicinity of the beach must be monitored (imperative for all regions where applicable)
21	A sustainable means of transportation should be promoted in the beach area (guideline for all regions)
Safety and services	
22	An adequate number of lifeguards and/or lifesaving equipment must be available at the beach (imperative for all regions)
23	First aid equipment must be available on the beach (imperative for all regions)
24	Emergency plans to cope with pollution risks must be in place (imperative for all regions)
25	There must be management of different users and uses of the beach so as to prevent conflicts and accidents (imperative for all regions)
26	There must be safety measures in place to protect users of the beach (imperative for all regions)
27	A supply of drinking water should be available at the beach (guideline for all regions)
28	At least one Blue Flag beach in each municipality must have access and facilities provided for the physically disabled (imperative for all regions)
Water quality	
29	The beach must fully comply with the water quality sampling and frequency requirements (imperative for all regions)
30	The beach must fully comply with the standards and requirements for water quality analysis (imperative for all regions)
31	No industrial, waste-water or sewage-related discharges should affect the beach area (imperative for all regions)
32	The beach must comply with the Blue Flag requirements for the microbiological parameter <i>Escherichia coli</i> (fecal coli bacteria) and intestinal enterococci (streptococci) (imperative for all regions) (see Table 11a below for microbiological limits)
33	<p>The beach must comply with the Blue Flag requirements for the following physical parameters (imperative for all regions) :</p> <ul style="list-style-type: none"> · There must be no oil film visible on the surface of the water and no odour detected. On land the beach must be monitored for oil and emergency plans should include the required action to take in case of such pollution. · There has to be an absence of floatables such as tarry residues, wood, plastic articles, bottles, containers, glass or any other substance.

Blue Flag limits of microbiological pathogens in beach waters (FEE, 2014)

Parameter	Coastal and transitional waters Limit values	Inland waters Limit values
Escherichia coli (Fecal Coli bacteria)	250 cfu/ 100ml	500 cfu/ 100ml
Intestinal Enterococci (streptococci)	100 cfu/ 100ml	200 cfu/ 100ml

cfu = colony forming units (of bacteria)

Appendix B: Interview Schedule for beach users, scientists, Municipal officials, politicians, and media persons

My name is Paul van Heerden (student number 205508149). I am doing research on the management of beach water quality and blue flag beaches in Durban. The research is being conducted for a Master's degree in the School of Built Environment and Development Studies at University of KwaZulu-Natal, under the supervision of Professor Dianne Scott (UKZN) and Dr. Louis Celliers (CSIR). I would like you to be part of this research. Should you wish to remain anonymous your identity will be strictly guarded and your name will not appear in the research. Additionally, you can withdraw yourself from the research at any point during the interview without any negative consequences.

Your participation in this research will be limited to an interview up to an hour long and I would like to request if I can record the interview as it will help me recall all the information you provide me with. All information gathered will be securely stored and may be included in the final research thesis.

Background/ Profile (all participants):

1. How old are you?
2. What do you do for a living?
3. How do you like to mostly spend your free time?
4. On average,
 - a. How often do you make use of the Durban beachfront and for how long?
 - b. How do you use the beachfront – what do you do here? - for what purposes?
What is your historical connection with the Durban beachfront? (*Prompt – how long have you been coming here – doing what etc.*)
5. What three things do you like most about the beachfront?
6. What three things do you like least about the beachfront (*use prompts to explore these questions*)?
7. What does the term *water quality* mean to you, as it refers to ocean/ sea water?
8. How would you describe the quality of the water along Durban's central beaches at different times of the year?
9. How does this influence the way in which you think about and use this space?

Blue Flag and Coastal Management Knowledge (all participants):

10. There has been quite a lot written about the Blue Flag Programme in Durban in the popular press:
- Do you know what the Blue Flag Programme is, please explain?
 - Why do you think a coastal city would want to have Blue Flag status for its beaches?
 - Why do you think it is called Blue Flag?
 - Are you aware of the ongoing debate surrounding the Blue Flag Programme and what are your thoughts on this? (*Prompt*)
11. Do you know of any other measurement/ management approaches to water quality that are used by coastal/ beach management authorities elsewhere. Please substantiate with examples?
12. Why did the eThekweni Municipality lose Blue Flag status for its beaches?
13. What system did the eThekweni Municipality replace Blue Flag with?
14. In your opinion, which of these two approaches to beach management is preferable in terms of its effectiveness, please explain why?
15. In relation to the beaches of the Golden Mile specifically, and beaches in general, what knowledge do you think is:
- Needed by managers in order to effectively manage the beachfront as a space?
 - Needed by the public in order to make informed decisions about how and when to use the beaches?

Users and Media Persons (surfers, beach goers, newspaper journalists):

16. How would you describe your use of the beachfront (Prompt - type of use/ activity, passive/ active user)?
17. Does your use of the beach vary seasonally, and if so, when during the year do you spend most of your time at the beach?
- ☐ Summer ☐ Autumn ☐ Winter ☐ Spring
18. For what period of your life have you been using the beach and has your use changed over time?
19. What experiences have you had with poor water quality?

20. Have you or anyone you know ever become ill or infected as a result of poor water quality, please explain by providing examples of illness and number of occurrences?
21. Have there been any instances in which you have decided against going to or using the central beaches over water quality concerns, please specify?

Scientists:

22. How is marine water quality measured in South Africa, and is it different to how it is measured in the rest of the world?
23. Can you please explain the link between the South African standards for marine water quality and epidemiology?
24. What are the main differences between:
 - a. The knowledge mandated by each of the two beach management systems adopted by the EM over the past decade?
 - b. The methods of data collection and analysis mandated by each of the two systems adopted by the EM over the past decade?

Municipal officials:

25. What are the current standards promoted by the eThekweni Municipality in terms of beach water quality and how do these differ with those of the Blue Flag programme?
26. What are the reasons for the loss of Blue Flag status?
27. Once the city had lost its Blue Flag status, how did they manage the water quality?
28. To what extent do you think the public are aware of these specific water quality measurements and forms of management?
29. Within the municipality, are there competing ideas and opinions on how best to effectively manage the water quality of the beaches of the Golden Mile? To what extent are you aware of these debates? If so, what are the competing ideas/ priorities/ strategies of management?
30. How has this situation changed over the last decade?
31. Much has been written in the popular press about the municipality's decision to reapply for inclusion in the Blue Flag Programme. Given this about turn, do you know what factors have impacted on the changing stance of the municipality in relation to Blue Flag and beach water quality?

Appendix C: Michael Sutcliffe Interview Schedule

My name is Paul van Heerden (student number 205508149). I am doing research on the management of beach water quality and blue flag beaches in Durban. The research is being conducted for a Master's degree in the School of Built Environment and Development Studies at University of KwaZulu-Natal, under the supervision of Professor Dianne Scott (UKZN) and Dr. Louis Celliers (CSIR). I would like you to be part of this research. Should you wish to remain anonymous your identity will be strictly guarded and your name will not appear in the research. Additionally, you can withdraw yourself from the research at any point during the interview without any negative consequences.

Your participation in this research will be limited to an interview up to an hour long and I would like to request if I can record the interview as it will help me recall all the information you provide me with. All information gathered will be securely stored and may be included in the final research thesis.

Blue Flag Knowledge:

1. There has been quite a lot written about the Blue Flag Programme in Durban in the popular press over the past 8 years or so:
2. Can you please provide an overview of what you understand the Blue Flag Programme to be?
3. Why do you think a coastal city would want to have Blue Flag status for its beaches?
4. Can you please give me your understanding of Durban's history with the Blue Flag Programme? (*Prompt*)
5. Do you know of any other measurement/ management approaches to water quality that are used by coastal/ beach management authorities elsewhere. Please substantiate with examples?
6. Why did the eThekwin Municipality lose Blue Flag status for its beaches? (*Prompt: relevance of standards for subtropical waters, subjectivity of application of standards, new testing method used by W&S department*)
7. What system did the eThekwin Municipality replace Blue Flag with and what does this system entail?
8. In your opinion, which of these two approaches to beach management is preferable in terms of its effectiveness, please explain why?

9. What are the main differences between:
10. The knowledge mandated by each of the two beach management systems adopted (BF vs EM system) by the EM over the past decade?
11. The methods of data collection and analysis mandated by each of the two systems adopted by the EM over the past decade?
12. To what extent do you think the public are aware of these specific water quality measurements and forms of management?
13. In relation to the beaches of the Golden Mile specifically, and beaches in general, what knowledge do you think is:
14. Needed by managers in order to effectively manage the beachfront as a space?
15. Needed by the public in order to make informed decisions about how and when to use the beaches?
16. Within the municipality, are there competing ideas and opinions on how best to effectively manage the water quality of the beaches of the Golden Mile? If so, what are the competing ideas/ priorities/ strategies of management?
17. The eThekweni Municipality has recently re-joined the Blue Flag Programme and at the annual Blue Flag launch in Knysna a few weeks ago, the municipality was awarded pilot status at 7 beaches. Given this about turn, do you know what factors have impacted on the changing stance of the municipality in relation to Blue Flag and beach water quality?

Appendix D: Alison Kelly Interview Schedule

My name is Paul van Heerden (student number 205508149). I am doing research on the management of beach water quality and blue flag beaches in Durban. The research is being conducted for a Master's degree in the School of Built Environment and Development Studies at University of KwaZulu-Natal, under the supervision of Professor Dianne Scott (UKZN) and Dr. Louis Celliers (CSIR). I would like you to be part of this research. Should you wish to remain anonymous your identity will be strictly guarded and your name will not appear in the research. Additionally, you can withdraw yourself from the research at any point during the interview without any negative consequences.

Your participation in this research will be limited to an interview up to an hour long and I would like to request if I can record the interview as it will help me recall all the information you provide me with. All information gathered will be securely stored and may be included in the final research thesis.

Background / Profile:

1. How old are you?
2. What do you do for a living? Please provide your job title and a brief description of your work?
3. How do you like to mostly spend your free time? (Prompts: Does it involve Durban's central/ Golden Mile beaches at all?)
4. On average, how often do you visit the Durban beachfront and for how long on each visit?
5. What do you do on these visits? (Prompts: How long have you been visiting the central beaches and how has this changed over the years? What is your connection to the space?)
6. What three things do you like most about the beachfront? (*use prompts to explore this question*)
7. What three things do you like least about the beachfront? (*use prompts to explore this question*)
8. What does the term *water quality* mean to you, as it refers to ocean/ sea water?
9. How would you describe the quality of the water along Durban's central beaches at different times of the year?

10. How does this influence the way in which you think about and use this space?

Blue Flag and Coastal Management Knowledge:

11. There has been quite a lot written about the Blue Flag Programme in Durban in the popular press:

- a. Do you know what the Blue Flag Programme is, please explain?
- b. Why do you think a coastal city would want to have Blue Flag status for its beaches?
- c. Why do you think it is called Blue Flag?
- d. Are you aware of the ongoing debate surrounding the Blue Flag Programme and what are your thoughts on this? (Prompts: please provide your understanding of how the 'saga' in Durban unfolded, including any specific dates in order to create a timeline of events)

12. Why did the eThekweni Municipality lose Blue Flag status for its beaches? (Prompts: what were the triggers? Was it purely a WQ issue or were there other factors that ignited the debate that played out in the public domain?)

13. When the municipality was failing to comply with the water quality criteria of Blue Flag, on average how far were they exceeding the limits?

14. What system did the eThekweni Municipality replace Blue Flag with? Please provide as much detail as you can about what the system entails.

15. In your opinion, which of these two approaches to beach management is preferable in terms of its effectiveness, please explain why?

16. In relation to the beaches of the Golden Mile specifically, and beaches in general, what knowledge do you think is:

- a. Needed by managers in order to effectively manage the beachfront as a space?
- b. Needed by the public in order to make informed decisions about how and when to use the beaches?

17. Do you know of any other measurement/ management approaches to water quality that are used by coastal/ beach management authorities elsewhere. Please substantiate with examples?

18. To what extent do you think the public are aware of the specific water quality measurements and forms of management?

19. Much has been written in the popular press about the municipality's decision to reapply for inclusion in the Blue Flag Programme. Given this about turn, do you know what factors have impacted on the changing stance of the municipality in relation to Blue Flag and beach water quality?
20. Within the municipality, are there competing ideas and opinions on how best to effectively manage the water quality of the beaches of the Golden Mile? (Prompts: to what extent are you aware of these debates? If so, what are the competing ideas/ priorities/ strategies of management?)
21. How has this situation changed over the last decade? (Prompts: what were the triggers that caused the change?)