3. THE STATUS QUO

3.1 Introduction and Overview

The status quo describes the natural and socio-economic resources in the area. It draws from various studies that have been done in the area and was improved through additional studies, extensive ground-truthing and the creation of secondary datasets. The status quo identified the sensitivity, extent, interrelationships and significance of attributes in the study area as well as the pressures that must be managed to protect these attributes. This information informs the desirability of certain development types and management guidelines for the area. All the information and data that ahs been collected is captured in a spatial database.

The issues that emanated from this phase define the context and the nature of the 'decision-space' for managing the environment and future development projects in the study area.

The character of the study area's landscape influences the way the terrestrial and biological environment functions. The decision-maker's attention is drawn to the **patterns of landscape features** which are the product of a host of processes that operate at or near the earth's surface and are arranged in various systems such as:

- Climatic systems
- Geological systems
- Geomorphic systems
- Drainage systems
- Ecosystems
- Land use systems

These systems overlap and interact in different ways and rates and the patterns and features we observe today represent an evolving picture. An analyses of the **'landscape dynamics'** of the study area (how the land surface features and processes change over space and time) provide the baseline information for future landscape planning, decision-making and monitoring.

3.2 The Physical Environment

3.2.1 Climate and Weather

Richards Bay climate is characterised by a warm to hot and humid subtropical climate, with warm moist summers. Average daily maximum temperatures range from 29 ºC in January to 23 ºC in July, and extremes can reach more that 40 ºC in summer (**Table 1**). The average annual rainfall is 1 228 mm and most (~80%) of the rainfall occurs in the summer, from October to March, although rainfall also occurs in winter ~20%). Early summer rainfall is derived mainly from deep convective showers and thunderstorm with occasional hailstorms. The late summer rainfall is less severe with more widespread convective activity associated with sub-tropical easterly circulation patterns.

Table 1: Climate data for Richards Bay based on monthly averages for the 30-year period 1961- 1990 (South African Weather Service, 2005)

MONTH	TEMPERATURE (° C)				PRECIPITATION		
	Highest Recorded	Average Daily Maximum	Average Daily Minimum	Lowest Recorded	Average Monthly (mm)	Average Number of days with >= 1mm	Highest 24 Hour Rainfall (mm)
January	41	29	21	11	172	12	317
February	39	29	21	13	167	12	145
March	39	29	20	14	107	10	253
April	37	27	18	8	109	8	130
May	35	25	15	7	109	7	88
June	35	23	12	6	57	6	82
July	31	23	12	4	60	6	135
August	37	24	14	5	65	7	62
September	40	25	16	6	77	9	65
October	42	25	17	10	105	12	99
November	43	27	19	11	114	13	135
December	42	29	20	13	86	11	78
Year	**43**	**26**	**17**	**4**	**1228**	**113**	**317**

Middle latitude frontal system can interact with the sub-tropical circulation to cause severe squall lines of thunderstorms that produce torrential rainfall. Winter rainfall generally occurs in association with middle-latitude frontal weather systems. Extreme rainfall has occurred on several occasions in the Zululand region from tropical cyclones which occasionally move close enough to the coast to produce extensive flooding with loss of life and property. An observed increasing trend in the frequency of cyclonic activity in the southern Indian Ocean needs to be considered in future planning for the region.

Rainfall variability over the last 30 years is illustrated in **Figure 3**. An extreme wet period occurred when Demoina and Imboa struck in 1984 after "the deepening drought of 1982-1983" which was correlated by some to major cholera outbreaks in the region. This was followed by the more extreme wet event in 1987. The data highlights the natural local climate variability that is typical of the study area and which makes it vulnerable to flooding and climate change.

The geomorphic landscape has been created by the wind and water in the region. Any development that will impede or enhance the wind speed or direction and the runoff will impact on the opportunities of the region.

During the day-time the winds are predominantly northeasterly or southwesterly winds with a combined frequency of occurrence of 24% (**Figure 4**). The north-easterly (thermal) wind is associated with high pressure systems and fine weather, and the south-westerly winds that are associated with westerly waves and cold, frontal weather. There is a decrease in the frequency of north-easterly winds at night when the southerly winds increasing in frequency and occurring 19% of the time as part of the land-sea breeze (the NE & SW winds are synoptic scale systems while the land-sea breeze is a local temperature gradient effect). More calm conditions (winds less than 1 m/s) occur at night than during the day. The diurnal variation in airflow over the region is influenced by the land-sea breeze circulation and topographically induced effects winds. These wind regimes, under the influence of a temperature inversion can have a large effect on the pollution loading in Richards Bay and are discussed in more detail in the specialist report.

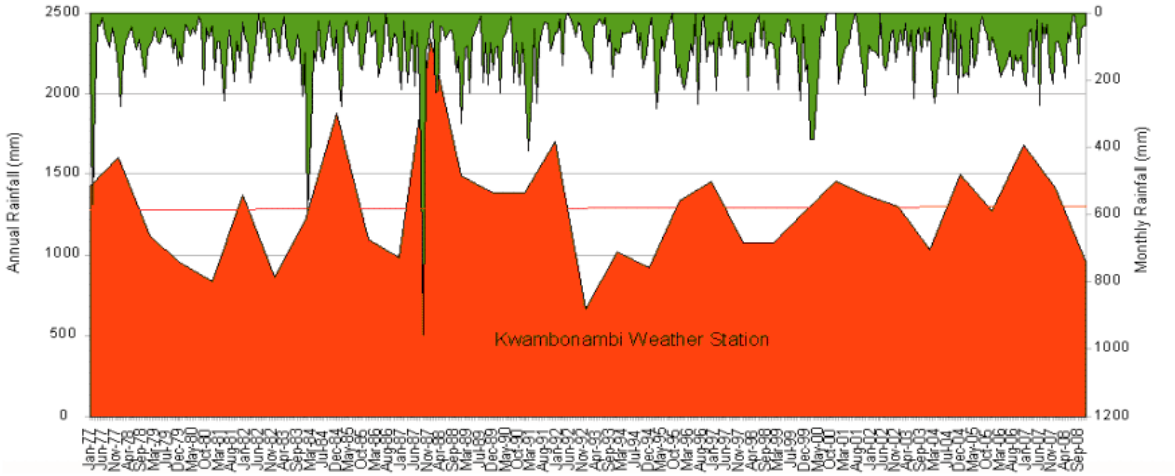

Figure 3: Rainfall patterns in Richards Bay (Source: SA Weather Services, 2009)

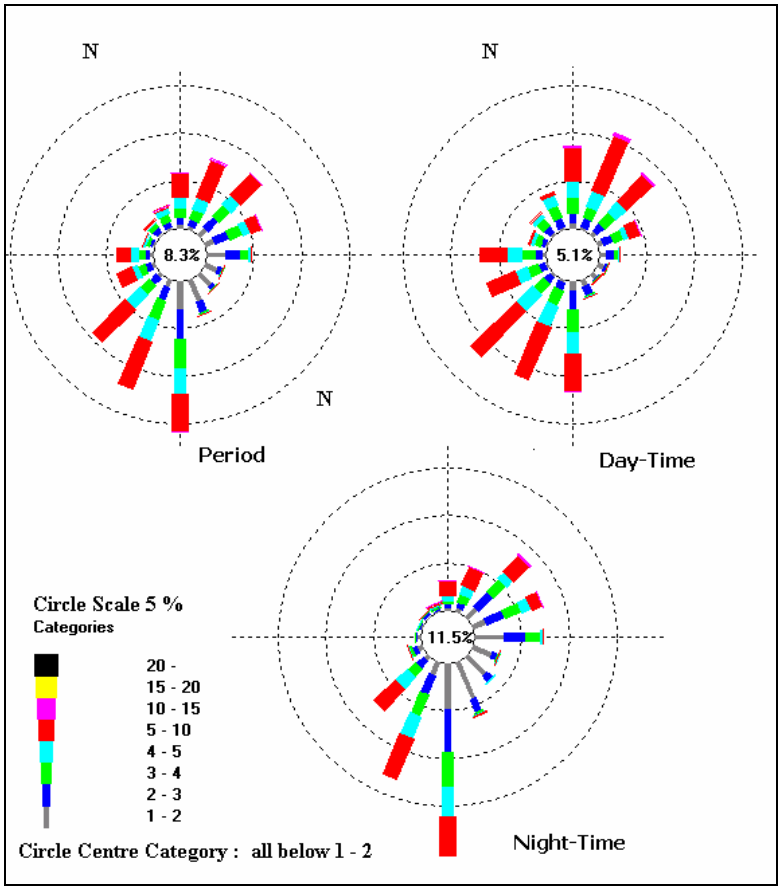

Figure 4: Period, day-time and nigh-time wind roses depicting the wind profile at the Richards Bay Airport for the period January 2002 to the 11th of May 2004 (Liebenberg-Enslin and Petzet, 2006)

The world climate is changing but it is unclear how it will impact on regions and communities. Future climate scenarios for South Africa project increases in temperature and rainfall events (but with the overall amount of rain staying the same), change in wind speed and natural climate variability. There is growing evidence of rising sea levels.

Detailed climatic data has been collected for the study area and is available in the EMF database.

The year round subtropical climate conditions offer opportunities for tourism. When coupled to the unique landscape features in the area, including the warm ocean, beaches, nature reserves and general scenic beauty these opportunities become more prominent.

ISSUES:

- Climatic conditions prevent the dispersal of pollution generated by local industries.
- Tropical cyclones and extreme rainfall events poses a risk to infrastructure, loss of human life and human well-being. Climate change may cause increases in extreme weather that will increase these risks.
- The risk associated with climate change and sea level rise, coupled with the landscape character of the study area, demands special attention in planning.

Figure 5: Example of the impact: The height of the inversion over Richards Bay shown by the height of the pollution trapped beneath. The heat from the exhaust from the factory pushes the inversion up but is not enough to penetrate the inversion (Photo: B Kelbe).