Editorial
Clean Air Journal's 45th anniversary
CAJ archive highlights the importance of continuous air quality measurements

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The Clean Air Journal celebrates its 45th year in 2016. The first issue started with an article on the problems with the application of the Atmospheric Pollution Prevention Act in South Africa (Boegman, 1971), and also included an article on Johannesburg's "good fortune" at having 3 000 acres of mine dumps available to revegetate into City Parks (Cook, 1971). Since 1971, the Clean Air Journal has aimed to report authentic scientific articles on the topic of air quality management and monitoring relevant to southern Africa.

Since starting the Clean Air Journal twitter handle (@CleanAirJ) earlier this year, I have been enjoying tweeting links to articles from the Clean Air Journal archives for Throwback Thursdays (#tbt). Writing these tweets has afforded me the opportunity to read through the Table of Contents from the Clean Air Journal's archives, and read countless articles. The history of air quality management, monitoring and atmospheric science contained in these archives is well-documented and thought-provoking.

While reading through these articles, it is striking how critical continuous and regular measurements are in improving our understanding of our atmosphere and of air quality. There are outstanding examples of regular monitoring in South Africa. Three such networks that I have found in my reading is a national network of sampling smoke and SO_2 started by the Council for Scientific and Industrial Research (CSIR) in 1955 (e.g. Kemeny, 1980; Kemeny and Wells, 1982), the Global Atmospheric Watch (GAW) at Cape Point (e.g. Brunke, 1983; Labushagne et al., 2002; Brunke et al, 2010), and the Deposition of Biogeochemically Important Trace Species-International Global Atmospheric Chemistry (IGAC) DEBITS in Africa (DEBITS-IDAF) network (e.g. Maritz, 2015). The strength in these networks is the high-quality, consistent and continuous monitoring. This has been achieved through well-developed and consistently applied methodologies for monitoring, data capture and reporting. In addition, through the long datasets reported in these papers, and with the knowledge of how difficult it is to keep instruments running (especially in far-off monitoring stations!), the attention to maintenance and upkeep of the networks is evident.

These networks are not the only successful long-term monitoring networks in South Africa; but, they do provide great examples of the hard work and dedicated resources needed to develop and maintain such high quality networks and databases. They also highlight the insights only regular and extended monitoring can provide. Two figures from Kemeny and Wells (1982) are shown below, which highlight the levels and trends in smoke pollution from 1950's-1980's (Figure 1) and concentrations of Mn and Pb in aerosol particles in Port Elizabeth (Figure 2). Without regular monitoring over the years, trends could not have been calculated and/or observed, and there would be no efficient way of verifying the success of regulatory policies. The results

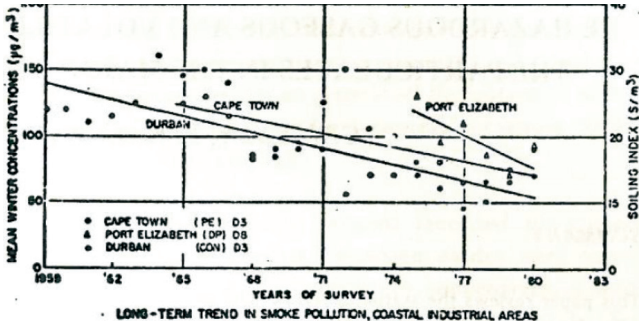

***Figure 1**: Mean winter concentration of smoke in coastal industrial areas in South Africa (taken from Kemeny and Wells, 1982).*

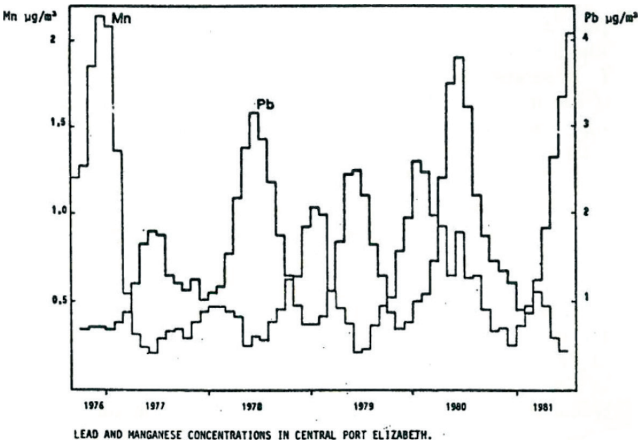

***Figure 2**: Lead (Pb) and manganese (Mn) concentrations in Port Elizabeth (taken from Kemeny and Wells, 1982).*

from this research provide a strong understanding of air quality in South Africa, and also provide a baseline for quantifying air quality trends over the past decades.

Let's look back at the 45-year history of the Clean Air Journal and reflect on the great research performed by the community and documented in the archives. It is important to remember the critical need to develop and to sustain continuous and

regular air quality monitoring. On-going research networks, such as DEBITS and GAW, continue to provide datasets that are invaluable, in large part, due to their continuity and high-quality measurements. Both of these on-going networks have had national and international impact. From the Cape Point GAW station that is the oldest continuous record of CO measurements in the Southern Hemisphere, to DEBITS that measure, among other things, the trends in acidic compounds in South Africa. In addition, the government-owned compliance monitoring networks can contribute greatly, as they provide invaluable insights into the state of air quality and, as they continue to operate continuously, into the trends in air quality across the country.

The monitoring networks that we begin now, and foster and grow, are the datasets the next generation of scientists will use to understand the impact of air quality management policies, as well as the impacts of climate change on air quality in Africa. To nurture such networks needs a collaborative effort of the whole community of scientists and policy makers.

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