

Archives Serving Science: Historic Maritime Records as Sources for Indian Ocean Climate Change Research: Potential and Problems

Graham Dominy

<https://orcid.org/0000-0002-8306-9796>

University of South Africa

graham@msunguli.co.za

Abstract

Climate scientists have identified the establishment of historical baseline data from which to determine degrees of climate change as a significant challenge. In this article the use of ships' logbooks and other sources for maritime history, to provide evidence of weather and climatic conditions pre-dating the era of modern meteorological data measurements, is discussed. The CLIWOC and TANAP projects utilising international archival resources to provide climatological and related information are examined. The discussion is then focused on the Indian Ocean rim countries and the archival and historical resources that may yield similar information. The article concentrates on sources in the Republic of South Africa, and sources in the Sultanate of Oman and Western Australia are discussed for comparative purposes. Utilising archival sources to provide historical climate-change related data aligns archivists and information scientists with the major imperatives of the South African Government. A beginning can also be made with developing south-south scientific and archival co-operation that can unlock new sources of historical and climatological knowledge.

Keywords: archives; climate change; CLIWOC; Indian Ocean; lighthouses; logbooks; TANAP

Introduction

The main purpose of this article is to establish the value of archival records containing data and associated information of use to scientists studying the origins of climate change in the Indian Ocean. This aligns the research with the fourth of the grand challenges listed by the Department of Science and Technology in its response to the Ten-Year Implementation Plan of the South African Government, namely, “Global Change Science with a Focus on Climate Change” (Skelly 2021). It also supports the cooperative objectives of the members of the Indian Ocean Rim Association (IORA). Alignment with major national governmental objectives will, hopefully, alert policy makers to the potential contribution that archives can make to overall socio-economic development and thus help counteract the neglect of archives due to lack of appreciation of its responsibilities and value (Duggan 2015, 11). While the principal focus is on records in archives and libraries in South Africa, documentation in the Sultanate of Oman and in the State Archives Western Australia is also referred to for comparative purposes.

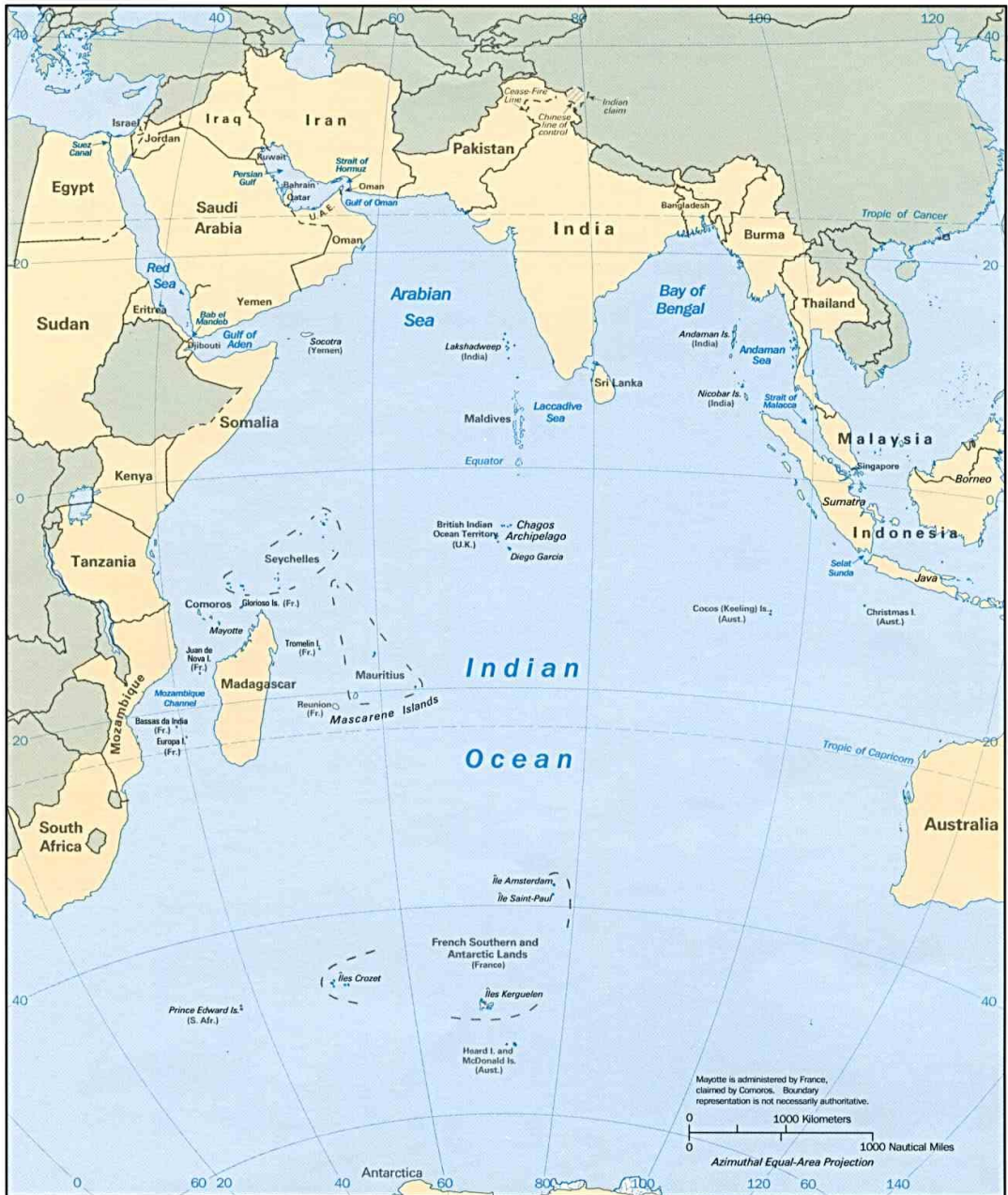
The methodological discussion focuses on early relationships between history and archival science and leads into a discussion of the value of certain archival records for oceanographic and climatological research. Extensive oceanic studies undertaken in the Climatological Database for the World’s Oceans (CLIWOC) project and utilising maritime logbooks are discussed. However, concern is expressed that this project was driven by climate scientists, while archivists and librarians were relegated to support roles. Nevertheless, it is suggested that the project methodology developed in the CLIWOC project could be modified for use in an exercise focused on the Indian Ocean. Another major international archival digitisation project is also discussed, namely the TANAP (Towards a New Age of Partnership) project. TANAP, unlike CLIWOC, was conceptualised and managed with the close involvement and leadership of archivists and historians.

This article originated as a presentation to a colloquium held on 21 September 2017, at the Nelson Mandela University (NMU) in Port Elizabeth (recently renamed Gqeberha), that was dubbed the “Indian Ocean Science Imbizo” (a Nguni language term for a gathering that is in common use in South African English). This imbizo was an interdisciplinary gathering intended to set an agenda for collaborative scientific research in and around the Indian Ocean and its littoral countries. It was also timed to provide academic support for national objectives for the period when South Africa was scheduled to act as chair of the Indian Ocean Rim Association (IORA), that is, for the years 2017–2019.

The IORA is a loose association of the states around the Indian Ocean littoral that is intended to foster peaceful progress, scientific co-operation, and economic development. The concept was first mooted in the early 1990s when South African Foreign Minister, Pik Botha, visited the Sultanate of Oman and suggested that the states around the Indian Ocean littoral should form a co-operative organisation (Ferguson

2019). It received great impetus from President Nelson Mandela who visited India in 1995, and motivated the formation of an umbrella organisation, saying, “the natural urge of the facts of history and geography should broaden itself to include the concept of an Indian Ocean Rim for socio-economic co-operation” (Mandela 1995). The states of the Indian Ocean littoral are shown in figure 1.

Indian Ocean Area



802126 (R00367) 5-93

Figure 1: Indian Ocean and littoral countries: <http://mapsof.net/indian-ocean/indian-ocean-area>

The Institute for Security Studies (ISS) in Pretoria held a seminar on 30 October 2017, intended to mark South Africa's assumption of leadership of the IORA. Its theme was, "South Africa navigates its new role as IORA head" and the participants focused more on strategic and political issues than on scientific matters (ISS 2017).

The purpose of the historical presentation at NMU was to suggest to scientists, especially oceanographers, that relevant information could be found in historical and archival sources from which to develop baseline data going back to a period long preceding the formal, or scientific, recording of mass meteorological data. In other words, to promote inter-disciplinary cooperation sustained by archival research (Dominy 2017). The approach was welcomed by the NMU organisers as a novel contribution to the scientific deliberations (De Wit 2017).

Methodology

A qualitative research method has been favoured in this article. This method has been defined as "the study of the nature of phenomena ... their quality, different manifestations, the context in which they appear or the perspectives from which they can be perceived" (Busetto, Wick, and Gumbinger 2020, 1). Qualitative and quantitative research methodology is also teased out by Punch (2013). Online sources, guides and registers of archives, as well as published secondary literature and theses were consulted in this research project. From these sources, it is possible to identify records of value to climate change scientists. The scientists may then be able to apply quantitative research methodologies to develop earlier climate change baseline datasets.

Literature Review

The relevant literature for this study includes works relating to archival theory, such as the classic manual compiled by Muller, Feith and Fruin (1940, original Dutch ed. 1902, English ed. 1940); the further British work by Jenkinson (1937); and Schellenberg's exposition of the principles of record management in the United States of America (Schellenberg 1965). These works illustrate the development of archival theory in association with the development of professional historical research. The discussion of research, of history, and of science, is drawn from the works of Barzun and Graff (1970) and Hill (1991). The work of Taylor (2007) centres the discussion on the use of archival records, particularly the logbooks of sailing ships, as sources for climate change research. The focus falls on two major research projects that reworked major archival sources containing logbooks and other historical records: the CLIWOC project, which took place between 2000 and 2003; and the TANAP project that took place between 2000 and 2007.

Moving more specifically to the Indian Ocean Rim countries, the discussion focuses on archival and secondary sources. The secondary sources, such as Al-Maamiry (1979), Al-Salimi et al. (2012), and Torabully and Gurib-Fakim (2010), are particularly important for the section on Arabian and Omani mariners. The archival sources in South

Africa are comprehensively described, and Naidoo (2016) provides insight into the information available in seventeenth century Dutch records in Cape Town. Archival sources in Western Australia and Oman are mentioned for comparative purposes.

Archives: Serving History and Science

Archival science grew from the original definition of archives in the pioneering work of Muller, Feith and Fruin who defined the term archive (or archival collection) as the whole of the written documents, drawings and printed matter, officially received or produced by an administrative body or one of its officials, in so far as these documents were intended to remain in the custody of that body, or that official (Muller et al. 1940, 13). Jenkinson (1937) developed archival theory by emphasising the principles of provenance, objectivity, and the organic nature of archival records. He and his American counterpart, Schellenberg (1956; 1965), disagreed on principles of appraisal; a disagreement based primarily upon the nature of the archival records on which they worked on opposite sides of the Atlantic (Tschan 2002). Schellenberg, who focused on the management of vast numbers of modern records, stressed the importance of the evidential and informational value of documents. In this he distinguished between the value of a document to its creator or original user (evidential) and its later value to historians and social scientists (informational).

Barzun and Graff (1970) claim that “in its mutability history does not differ from science.” Science changes its interpretations every few years, both science and history are variable (Barzun and Graff 1970, 55). Hill (1991) has stated that history “has to be rewritten in every generation, because although the past does not change the present does; each generation asks new questions of the past and finds new areas of sympathy as it re-lives different aspects of the experiences of its predecessors” (Hill 1991, 15).

With the global challenge of climate change, the urgent questions the current generation needs to ask, differ significantly from those asked by earlier generations. Accordingly, archives are now being interrogated for scientific information, rather than historical or socio-economic information. The new challenge is to identify archival sources that contain climatological information recorded during the centuries before modern scientific measurements were recorded. These sources require interpretation, for example, distance measurements such as leagues, and depth measurements such as fathoms, are no longer in general use. Therefore, archaic language and measurements need to be rendered into modern terminology or converted into standardised measurements.

The interpretation of archives requires both the imagination of an artist and the precision of a scientist. This process is considerably aided once the relationship between the archives and the organisation that created them is ascertained. In this article the scientific importance of archives created by organisations across several continents is emphasised. The capacity of the state in Oman to create archival records is compared with that of the colonial powers. Within this context, the interpretation of the archives

requires imagination and cultural understanding. In other words, understanding of the world view of the creators of the archive is essential for interpreting the significance of the data in the archive.

Taylor (2007), a former journalist in South Africa during the fraught early 1990s, has written *Storm and Conquest*, a dramatic account of the Anglo-French rivalry in the Indian Ocean during the Napoleonic Wars, focusing on the British conquest of Mauritius in 1809 and 1810. Even though this is a work of popular history, Taylor bases his narrative on thorough research into the archives, particularly relying on the accounts in the logbooks of ships of the British East India Company. The voyages of the sailing ships of the European trading companies that exploited the resources of Asia, took place with regularity and frequency over two or more centuries. Therefore, they provide a sufficient amount of data from which information can be derived and theories developed.

Logbooks are the records of a ship's voyage; they describe events, observations, incidents, and weather conditions. They are usually compiled as a daily record, but often contain incidents recorded on an even more frequent basis. The scientific value of these records is because in an era before science education was formalised, mariners were among the best trained and experienced observers of natural phenomena.

The logbooks Taylor used, are to be found in the India Office Records at the British Library. Taylor interpreted the logbooks, diaries, letters and journals, using the strength of his imagination. However, he depended on the primacy of the logbooks as accurate records of conditions and events, or non-events. Wilkinson (2012, 69) describes the value of British logbooks used in a major scientific study, the CLIWOC project, that yielded every imaginable permutation of weather conditions and associated incidents. As such, he concluded, marine logbooks represent a rich resource for both the climatologist and the maritime historian. The CLIWOC project has been discussed extensively in the literature in an issue of *Climate of the Past* (Wheeler and Wilkinson 2005), sponsored by the European Geosciences Union.

The CLIWOC Project

The first major international examination of the valuable information to be found in maritime logbooks, was the CLIWOC (Climatological Database for the World's Oceans) project, funded by the European Union between 2000 and 2003. This project brought together academic and technical partners from the United Kingdom, the Netherlands, France and Spain (Herrera et al. 2003). The aim was to analyse logbooks compiled aboard the sailing vessels of Europe's major maritime powers over the period from 1750 and 1850, in order to develop a standardised method of extracting weather and climatological data. The study was based on the premise that officers and master mariners of warships or large merchant vessels such as East Indiamen, were highly trained observers and regular recorders of natural phenomena. These logbooks provide an immense trove of data to be mined by historians and scientists alike.

The CLIWOC project had four objectives (Herrera et al. 2003):

1. To produce and make freely available for the scientific community the world's first daily climatological database for the period 1750 to 1850.
2. To realise the potential of the database to provide a better knowledge of oceanic climate variability over the study period.
3. To use the information to extend and enhance the existing oceanic-climate databases.
4. To disseminate the proposal's findings and to stimulate interest and awareness in this source with a view to fostering its further development and realising its scientific potential.

One of the major challenges was to standardise terminology, as the late eighteenth and early nineteenth century logbooks contain archaic measurements and vocabulary and were compiled in four languages: English, Dutch, French and Spanish. The project therefore concentrated on producing a dictionary of terms to complement the database. The observations recorded in the logbooks provide information on wind direction and strength, temperature, atmospheric pressure, currents, sea-state and, when in shallow water, shoaling and sea-bottom conditions. All this information can be manipulated to provide raw data for use in climate change research. The number of logbooks surveyed is given in table 1.

Table 1: Number of CLIWOC logbooks and observation by country (Herrera et al. 2003, 9).

Country	Logbooks	Observations
Spain	408	50,935
UK	591	88,475
Netherlands	613	126,541
France	12	7,378
TOTAL	1,624	273,269

This is further refined in table 2.

Table 2: Breakdown of data-items by period; ocean; country (Herrera et al. 2003, 20).

Country	Period	N-Atlantic Ocean	S-Atlantic Ocean	Indian Ocean	Pacific Ocean	All Oceans
Spain	≤ 1800	28,236	11,622	319	1,614	41,791
	> 1800	399	190	301	89	979
UK	≤ 1800	31,603	12,530	16,104	1,281	61,518
	> 1800	9,270	5,202	7,002	200	21,674
Netherlands	≤ 1800	20,045	5,109	5,142	0	30,296
	> 1800	31,932	18,348	26,617	1,481	78,378
France	≤ 1800	3,898	158	159	896	5,111
	> 1800	32	28	46	0	106
TOTAL		125,415	53,187	55,690	5,561	239,853

According to these tables, Portuguese sources were not consulted during the CLIWOC project. No reason for this omission is stated. One possible reason for this is that the Lisbon earthquake of 1755 destroyed a great many of the records. However, there may be considerable scope for further investigations in India because copies of letters, business documents and royal instructions were kept in both Lisbon and Goa (Al-Salimi et al. 2012, xxi).

While it is a truism to claim that imperialism was carried across the globe in European ships (first sailing vessels then steamships), trade, the flag and even science were closely linked, and this is often reflected in the record. It is now appropriate to examine another project that, while it also reflects European enterprise across the oceans, opens a window on indigenous agency. The Dutch trading empire in the East was centred on Batavia, now Jakarta, Indonesia and the records reflect intense interactions between the Dutch and local and regional leadership centres, including some of considerable power and autonomous agency.

The TANAP Project

In the same year as the CLIWOC project began, another multi-national archival project, centred in the Netherlands and its old trading empire, was launched. The world's first multi-national trading company was the Dutch East India Company. The VOC (Verenigde Oost-Indische Compagnie) was established in 1602 and awarded a monopoly over the spice trade between the Netherlands and Asia. This brought great wealth to the little Netherlands and brought Dutch settlement to South Africa. Dutch trading stations in the Middle East, in India, Ceylon (modern Sri Lanka), Indonesia,

across what has been described as “Monsoon Asia” (as well as at the Cape of Good Hope), generated vast quantities of records.

The purpose of the TANAP project was to digitise, preserve and popularise this immense resource of some 25 million pages scattered in repositories across three continents. They are held in archives in Cape Town, Chennai, Colombo, Jakarta and The Hague (TANAP 2007; TANAP 2020). Much of the focus is on records revealing political and socio-economic conditions, especially on interactions between the intruding Dutch traders and settlers and indigenous societies. In its earlier years, the VOC dominated its British and Portuguese rivals in terms of size, sophistication and profits.

The VOC documentation does reflect descriptions of climatological interest; one South African example being Jan Van Riebeeck’s diaries, which record weather-related phenomena. These have been analysed by Naidoo (2016) in an innovative Master’s dissertation that synthesises both historical and scientific approaches. A further reason why the TANAP project is relevant to this topic, is its value as a model of international archival collaboration. By linking information from three continents into one database, the TANAP project has made scattered records, that were virtually unusable, accessible, interlinked and better preserved. The VOC records have now been inscribed in the Memory of the World Register (the archival equivalent of World Heritage Status).

There is a significant difference between the approaches taken in the CLIWOC and the TANAP projects: archivists played a leading role in the TANAP project as they defined the scope of the project, identified the records and interpreted their significance with the help of historians. In the CLIWOC project, archivists played a supporting role, as the driving force was provided by climate change scientists.

It should be emphasised, once more, that both projects mined European resources, and this raises the question of what resources are available in the countries of the Indian Ocean littoral and how they would assist in providing new interpretations.

The Span of Archives around the Indian Ocean

The Indian Ocean served as a major world trading route long before the Portuguese burst in early at the beginning of the sixteenth century. The earliest evidence of sea travel between the Arabian Peninsula, the Persian Gulf and the nearest shores of Africa and South Asia, has been traced to the Magan civilisation in the 3rd millennium BC, in what is now Oman (Al-Maamiry 1979).

The maritime trading routes linked the Red Sea and the Persian Gulf to the coast of East Africa, to the Indian sub-continent, Indonesia, the Malay Peninsula and across the South China Sea to China itself. Arab, Indian and other Asian navigators were masters of the monsoons. In fact, Vasco da Gama acquired an Omani pilot when he entered the northern Indian Ocean (Al-Salimi et al. 2012, xii). The arrival of European powers did

not close the sea to other users and for the next few centuries, Ottoman, Persian, Chinese, Indian and Arab mariners were active traders. It was only the advent of steam ships that seriously disrupted traditional patterns (Torabully and Gurib-Fakim 2010). All these powers and their traders have left their archival traces, however rudimentary.

Not all states around the Indian Ocean littoral are yet members of IORA; Pakistan being a notable absentee. However, most member states are likely to have archival holdings containing data relevant to the history of climate change across and around the ocean; particularly Sri Lanka and India (the regional archives in Goa), as well as Mumbai and Chennai (previously Bombay and Madras), Oman and Mauritius.

To the east, across the ocean from South Africa, is Australia. The State Records Office of Western Australia has relevant records. The harbour master's journals for the port of Fremantle (1860–1909) record not only the day-to-day work of the port, but the weather conditions as well. The logbooks of the harbour master of Albany give a daily record of weather, shipping and local occurrences. Lighthouse journals also record weather conditions (harbour and shipping records). However, the focus in this article is on the potential sources in South Africa and Oman. The archival record in South Africa began in the seventeenth century with the Dutch occupation of the Cape of Good Hope. Most of the nineteenth century records were created during the period of British colonisation, including those records compiled in the Colony of Natal. South African documentation not only pre-dates Australian documents, but it reflects two nationally different types of colonial administration.

Oman has been selected for particular study in this article because it is an ancient civilisation and has a long maritime tradition. Oman was not only a key participant in trade with Asia, but was an imperial power in its own right, before the advent of Western imperialism. Oman also dominated the East African coast and Zanzibar, rather than Muscat, and it was the seat of the Sultan for many decades following 1840. Omani influence over the coastal trade of East Africa had been profound since they defeated the Portuguese in Mombasa and captured Fort Jesus after a long siege between 1696 and 1698 (Valeri 2017).

South Africa

State-agency maritime records relevant to the Indian Ocean during the period under discussion are located at the Western Cape Provincial Archives Repository in Cape Town and at the Pietermaritzburg Repository of the KwaZulu-Natal Provincial Archives Service. The National Archives in Pretoria hold post-1910 records of the central government, but no records relevant to maritime matters earlier than this date. The online search engine for South African archival information, NAAIRS (National Automated Archival Information Retrieval System), has recently been upgraded and provides the first access point for research.

The VOC archives in the Western Cape Archives Repository have already been mentioned in the context of TANAP, but the focus of this project was on records of political and socio-economic importance. However, many records do well contain incidental references to weather conditions that will create a context for researchers, as Naidoo (2016) has demonstrated. Specific harbour records exist from the period of the two British occupations; first from 1795 to 1803, and then from 1806 until self-government was established in 1872. During the British period, government activities grew more complex, and ports were established along the coast at Mossel Bay, Port Elizabeth, and East London. Lighthouses were also built at many places along the coast as aids to navigation (see table 3). The records for the harbours along the coast, including those of Port Elizabeth and East London, are to be found in the Western Cape Archives in Cape Town.

Table 3: List of nineteenth century lighthouses along the South African coast (Wikipedia)

Name	Location		Construction Date
Bird Island	Algoa Bay	Eastern Cape	1852
Bluff	Durban	Natal	1867
Cape Agulhas	Cape Agulhas	Western Cape	1849
Cape Point	Simon's Bay	Western Cape	1860
Cape Recife	Algoa Bay	Eastern Cape	1851
Cape St Blaize	Mossel Bay	Western Cape	1864
Castle Point	East London	Eastern Cape	1860
Danger Point	Gansbaai	Western Cape	1895
Dassen Island	Yzerfontein	Western Cape	1893
Great Fish	Port Alfred	Eastern Cape	1898
Green Point	Cape Town	Western Cape	1824
The Hill	Port Elizabeth	Eastern Cape	1861
Hood Point	East London	Eastern Cape	1895
Mouille Point	Cape Town	Western Cape	1842
Port Shepstone	Umzimkulu River	Natal	1895
Robben Island	Table Bay	Western Cape	1865
Roman Rock	Simon's Town	Western Cape	1845
Seal Point	Cape St Francis	Eastern Cape	1878

Logbooks of local coastal shipping are more likely to have survived in the collections of local museums than in the provincial archives. The Simon's Town Museum collects and exhibits the cultural history of the people of Simon's Town and their connections with the Dutch East India Company and the Royal Navy (Simon's Town Museum Collecting Policy). The museum has the most comprehensive collection relating to the naval ships and operations along the Cape Coast and thus is an important potential source for climate change documentation. The Special Collections at the University of Cape Town contain the papers of Admiral Sir Baldwin Wake Walker, which include a valuable item described as "Handwritten logbook of HMS *Narcissus* of the cruise to the East Coast of Africa between 1.6.1862 to 25.8.1852" (BC 356) (Wake Walker, Admiral Sir Baldwin, 1862–1864).

The former Natal Archives Depot, now the Pietermaritzburg Archives Repository of the KwaZulu-Natal Provincial Archives Service, is the repository for records of the colonial era. These include the early records of the port captain and harbour department for Durban harbour and of the harbour board. Durban was also known as Port Natal. Climatic conditions were closely observed as access to the Bay of Natal was difficult and depended on a fortunate confluence of wind and tide. Natal records can also be accessed through NAAIRS, but an academic guide to the collections was compiled during the 1960s and a revised edition was published during the 1980s (Webb's Guide, in Verbeek, Nathanson, and Peel 1984). In addition to the records (Campbell Collections) held in the provincial archives in Pietermaritzburg, the Killie Campbell Africana Library, part of the University of KwaZulu-Natal in Durban, has accounts of shipwreck survivors dating from the sixteenth as well as later centuries.

The Durban Local History Museum is also responsible for the maritime museum and, therefore, also serves as a useful source for information. It must be emphasised that this is not an exhaustive list, but it serves to indicate the types of records where fruitful results from searches may be anticipated.

Oman

Oman has a centuries-old tradition that has left a trail of records and physical evidence describing the interaction of the Omanis with the Indian Ocean world. One of the earliest writers describes voyages from the pre-Portuguese period but, in general, written accounts are relatively scarce (Tibbetts 1971). However, for the earliest periods much information has been derived from extensive archaeological excavations. The onshore remains of Oman's great maritime past are plentiful (see figure 2).



Figure 2: Ruins of Sumharum, or Khor Rori, looking out from the citadel to the Indian Ocean, UNESCO World Heritage Site (photograph G. Dominy, April 2019).

In the south of the sultanate, near Salalah in the Dhofar governorate, are the remains of the ancient city of Sumharam, known in Arabic as Khor Rori, and in ancient times as Moscha Limen (figure 2). This city was central to the worldwide trade in frankincense, and it reached the height of its power and influence between the fourth century BC and the fifth century AD. Pliny the Elder referred to an Eastern power named Omana in his *Natural History* written during the first century AD (World Heritage Statement 2015, UNESCO). However, this article will concentrate on the period from the eighteenth century. A triangular trade had developed between the Arabian Peninsula, India, and East Africa, in which the ports of Oman were key points for trade, ship repair and the recruiting of seamen. The western terminus of the voyages was in Kuwait, at the mouth of the Tigris and Euphrates delta (Al-Hijji 2010).

Arab and Omani navigators appear not to have left as comprehensive a corpus of records as their Western counterparts, but no detailed investigation has yet been undertaken. We will discuss the type of records left by the Arab navigators and writers and indicate where documentation is likely to be found in Oman. A compendium of travel narratives from the eighteenth and nineteenth centuries was published in 2009 (Hasan 2009). However, Torabully and Gurib-Fakim's (2010) maritime history of the Indian Ocean between 1100 and 1900 is a compilation of research papers published with the support of the governments of Qatar and Mauritius. These papers highlight the contribution of Arabs and Muslims to the history of the Indian Ocean and the world.

One of the most perceptive accounts is that of Mirza Itesa Modeen, who travelled across the Indian Ocean to London in the late eighteenth century. His account is prefaced with appropriately pious Islamic religious sentiments, but he was impressed by the bravery and agility of the European sailors. He also described Asian capabilities and technologies with an acute eye. One example is when his ship stopped at the Maldives Islands, he described how boats were built from palmyra trunks, bound together with ropes. They were used for trading between the islands and Indian cities such as Madras in the Bay of Bengal. Modeen also endured a severe storm at sea that forced his ship to spend two weeks under repair in Mauritius (or Ile de France as it was then known), but the journal account of the storm is merely suggestive rather than fully descriptive (Hasan 2009, 24–26).

Mirza Itesa Modeen was a traveller, but a more authoritative keeper of records was the “Nakhoda” of a trading dhow. Such a man was more than just the ship’s captain, he was also the accountant and record keeper, a “Jack of all trades” who “has much on his mind, conducting that great ship over the face of the eastern waters, tending her people and her trade, and bringing her back safe to her home at the head of the Persian Gulf” (Al-Hijji 2010, 54–55).

Such accounts would be of immense value as historical records, but locating them in this preliminary survey has been difficult. The reason is that there was never an overarching commercial or political authority that was required to keep records the way the BEIC or the VOC were. Even as late as 1970, when His Majesty Sultan Qaboos bin Said al Said succeeded his father as ruler of Oman (after a palace coup), he inherited a territory without a state (Valeri 2017, 4). However, over the past 50 years, Oman has acquired all the apparatus of a modern state, including universities and archives. Although the sultanate does not have the extravagant resources of its oil-rich neighbours, sufficient funds have been made available for the collection of cultural artefacts, including manuscripts.

The library of Sultan Qaboos University currently undertakes the role of a national library as well as an academic library and has assembled a collection of manuscripts. The second major collecting agency is the National Records and Archives Authority (NRAA) and there is a smaller collection at the National Museum. The Oman Across Ages Museum, currently under construction in the interior near Niswa, has two or three manuscripts containing information relating to Oman’s maritime history. In each of these collections the manuscripts reflect the conditions of life afloat. The regional museums in Salalah, Sohar and Sur also have exhibitions and collections providing information on Oman’s maritime history. These museums also collect manuscripts that document the country’s seafaring legacy.

The NRAA has conducted an extensive copying project of Oman-related sources with the assistance of the former Public Record Office, now the National Archives, in London, and of the British Library. The British Library holds the archives of the India

Office Library and Records. These may perhaps be described as “orphaned archives” as they are not British Government records eligible for archiving at the National Archives in Kew. They are, however, an immensely rich source and provide information on countries and territories far beyond the Indian sub-continent, including the island of St Helena.

The imperial Government of India and its predecessor, the BEIC Residency of Bombay, maintained a close interest in the affairs of Arabia and the Persian Gulf area, including Oman. The shores of Oman and the Persian Gulf were surveyed between 1820 and 1829 by naval officers in ships of the Bombay Marine (the colonial era predecessor of the modern Indian Navy). All the officers were trained to carry out marine surveys as part of their duties. Several maps and nautical charts of high technical quality can be accessed at the NRAA in Muscat.

The comprehensive survey of the Persian Gulf included coastlines beyond the modern gulf and provides invaluable historical and scientific information. The surveyors were instructed to develop a comprehensive body of information about the Gulf for navigational, military and commercial purposes. The coastline with its shoals, soundings, prevailing winds and coastal topography were described, in addition to political, anthropological and economic information (Cook 1990, I xi). The annotated charts provide nuggets of information useful for climatological research. One example is a chart of the Arabian Sea, as surveyed in 1874, that refers to volcanic eruptions causing navigational hazards along the Makran Coast (OM.NRAA. E1.14).

Information of this nature is useful for providing the context to climatological information illustrating climate change. For example, sandbanks shift according to tides and currents and dramatic weather changes produce dramatic results. Such details can be determined by comparing charts drawn over a number of years (Al-Qasimi 1996). When this is compared with the information that can be gleaned from manuscripts written in Arabic, then new and regionally focused perspectives on the Indian Ocean world can be developed. The records of the Nakhoda of the trading dhows will be critical records to trace and translate.

Conclusion

This article has attempted to show, through a survey of archival sources primarily in South Africa, but also with references to sources in Oman and Western Australia, how research into maritime records that may reveal climate-change related data, can be fruitfully conducted around the Indian Ocean rim. State organisations have created archives, and the colonial and metropolitan offices required the marine logbooks for their administrative purposes. What this article has attempted to illustrate is that similar data can be gleaned from archival sources beyond metropolitan cities in Europe. The South African and Australian examples show that the archives are similarly structured to those in Europe and, therefore, a similar methodology to that used in the CLIWOC project can be used in these countries. However, a sense of history is still necessary to

understand the mindset of the creators of the records, be they Omani Muslims, Dutch Calvinists, Portuguese Catholics, or British Anglicans.

The manuscript records in Arabic require a different approach, as the state and trading structures on the Arabian Peninsula were different to those of European or colonial origin. A more appropriate cultural approach involving Omani and other scholars proficient not only in the Arabic language, but in local maritime cultural practices, will be needed to unlock the information in those archives.

Beyond the Arabian Sea, and with strong cultural, historical, and economic links to both Oman and South Africa, is India with archival resources of enormous potential value. The links between India and South Africa were developed by British colonialism, but the links with Oman are centuries older. There is also a Portuguese dimension that was not included in the CLIWOC project and it is likely that Goa, once the centre of Portuguese power in the Indian Ocean and in Asia, would reveal sources even richer than those surviving in Lisbon itself.

A broad project under the auspices of IORA would promote south-south scientific and cultural co-operation; this would effectively further South African national objectives and this would enhance the importance and visibility of the archives and information sector in the eyes of policy makers.

Acknowledgements

In South Africa, I gratefully acknowledge the assistance of the staff of the Western Cape Archives Repository in Cape Town and the Pietermaritzburg Archives Repository of the KwaZulu-Natal Provincial Archives Service. I am also most grateful to Clive Kirkwood, University of Cape Town Library, Special Collections; former Ambassador Malcolm Ferguson, the National Archivist of South Africa; Mr Puleng Kekana, and Ms Erna-Marie Pretorius of the Records Management Section of the National Archives. In Oman I thank the staff of the National Records and Archives Authority and the Oman Across Ages Museum, both in Muscat. I am particularly grateful to Anne Dominy for her critical assistance and advice and for tabulating data and to James Dominy for solving computer referencing glitches.

References

- Al-Hijji, Y. Y. (translation by F. A. I. Bishara). 2010. *Kuwait and the Sea: A Brief Social and Economic History*. London, Bloomsbury Place: Arabian Publishing.
- Al-Maamiry, A. H. 1979. *Oman and East Africa*. New Delhi: Lancers Publishers.
- Al-Qasimi, Sultan B. M. (Ed.). 1996. *The Gulf in Historic Maps 1493–1931*, 95. Map by Theo Bowen, c. 1780: A Correct Map of the Ottoman Empire. Leicester, England: Thickprint.

- Al-Salimi, A., and M. Jansen et al. (Eds). 2012. *Portugal in the Sea of Oman Religion and Politics: Research on Documents 1504–1522*, Vol 1. Aachen, Centre for Documentation and Conservation, Philipp von Zabern, and Muscat, Ministry of Endowment and Religious Affairs.
- Barzun, J., and H. F. Graff. 1970. *The Modern Researcher*. New York: Harcourt, Brace and World.
- Busetto, L., W. Wick, and C. Gumbinger. 2020. “How to Use and Assess Qualitative Research Methods.” *Neurological Research and Practice* 2 (14): 1–10. Accessed July 19, 2021. <https://doi.org/10.1186/s42466-020-00059-z>.
- Campbell Collections. Accessed June 20, 2019. <http://campbell.ukzn.ac.za/?q=node/42>. Killie Campbell Library, Campbell Collections, University of KwaZulu-Natal, Durban.
- Cook A. S. 1990. *Survey of the Shores and Islands of the Persian Gulf 1820–1829*, Vols 1–5. Archive Edition, reproduced from original material in the India Office Library and Records, London (British Library), Vol 1, xi.
- De Wit, M. 2017. Email communication, 22 August. <https://doi.org/10.36866/pn.106.22>.
- Dominy, G. 2017. “Routes across the Indian Ocean: Historic Archives of Climate Change.” Unpublished paper presented to “Indian Ocean Science Imbizo”: Nelson Mandela University, Port Elizabeth, 21 September.
- Duggan, J. (Compiler and editor). 2015. *State of the Archives: An analysis of South Africa’s National Archival System, 2014*. Cape Town, The Archival Platform.
- Ferguson, Ambassador M. 2019. oral/email, personal communication, 14 June.
- Harbour and Shipping Records: Fremantle and Albany. Accessed June 18, 2019. <http://www.sro.wa.gov.au/archive-collection/collection/harbour-and-shipping-records>. State Records Office of Western Australia.
- Hasan, M. 2009. *Exploring the West: Three Travel Narratives*. Delhi and Oxford, University Press. <https://doi.org/10.1093/acprof:oso/9780198063117.001.0001>.
- Herrera, R. G., D. Wheeler, G. Können, F. Koek, P. Jones, and M. R. Prieto. 2003. *Cliwoc Final Report* (UE contract EVK 2–CT–2000–00090).
- Hill, C. 1991. *The World Turned Upside Down: Radical Ideas during the English Revolution*. London: Penguin.
- Institute for Security Studies. 2017. “South Africa Navigates its new Role as IORA head.” Email notification of IORA Seminar, webmaster@issafrica.org. 25 October.
- Jenkinson, H. 1937. *A Manual of Archive Administration*. London: Percy Lund, Humphries.

- Mandela, N. 1995, “Speech in India” cited in “About IORA.” Accessed July 20, 2021. <https://www.iora.int/en/about/about-iora>.
- Muller, S., J. A. Feith, and R. Fruin. 1940. *Manual for the Arrangement and Description of Archives*. Original Dutch edited in 1902, English translation by A. H. Leavitt, 1940. This edition with new introduction 2003, Society of American Archivists, Chicago.
- Naidoo, R. 2016 “A Glimpse at the 17th Century Cape Climate of Southern Africa: Documentary Based Evidence from the Van Riebeeck Diaries.” MSc dissertation, University of the Witwatersrand.
- OM.NRAA. E1.14 Map: Chart: Arabian Sea: Muscat to Karachi 1874. NRAA, Muscat.
- Punch, K. F. 2013. *Introduction to Social Research: Quantitative and Qualitative Approaches*. London: Sage.
- Schellenberg, T. T. 1956. *Modern Archives: Principles and Techniques*. Chicago, University of Chicago Press.
- Schellenberg, T. R. 1965. *The Management of Archives*. New York, Columbia University Press.
- Simon’s Town Museum Collecting Policy. Accessed June 19, 2019. <https://www.simonstown.com/museum/index.html>.
- Skelly, L. 2021, “The Success and Failure of South Africa’s Ten-Year Implementation Plan (2008) as Measured by Research Output.” *Mousaion* 39 (1): 17. <https://doi.org/10.25159/2663-659X/7921>.
- TANAP. 2007. Accessed June 15, 2019. www.tanap.net/content/about/heritage.cfm.
- TANAP News. 2020. “Asia and South Africa: A Missing Link of nearly Seven Million Words.” IIAS Newsletter #32. Accessed July 19, 2021. https://www.iias.asia/sites/default/files/2020-11/IIAS_NL32_51.pdf.
- Taylor, S. 2007. *Storm and Conquest: The Battle for the Indian Ocean, 1809*. London: Faber and Faber.
- Tibbetts, G. R. 1971. *Arab Navigation in the Indian Ocean before the Coming of the Portuguese: Translation of Kitab al-Fawa'id fi usul al-bahr wa'l-qawaid of Ahmed b. Majid al-Najdi*. London: Royal Asiatic Society.
- Torabully, K., and A. Gurib-Fakim. 2010. “A Traveller’s Narrative: A Voyage to Istanbul: The Ottomans in the Indian Ocean.” In *The Maritime History of the Indian Ocean from Al-Idrissi to ibn Majid and beyond*, edited by K. Torabully, and A. Gurib-Fakim. Doha, Ministry of Culture, Arts and Heritage, State of Qatar, 109–145.

- Tschan, R. 2002. "A Comparison of Jenkinson and Schellenberg on Appraisal." *American Archivist* 65 (32). 176–195.
- Valeri, M. 2017. *Oman: Politics and Society in the Qaboos State*, revised paperback edition. London: Hurst and Company.
- Verbeek, J., M. Nathanson, and E. Peel. (Compilers). 1984. *Webb's Guide to the Official Records of the Colony of Natal*, 3rd revised edition. Pietermaritzburg, University of Natal Press, 198.
- Wake Walker, Admiral Sir Baldwin, 1862–1864. "Handwritten Logbook of the Cruise to the East Coast of Africa between 1.6.1862 to 25.8.1862." University of Cape Town, Special Collections Fonds BC 356 "Sir B Walker Papers."
- Wheeler D. A., and C. Wilkinson. 2005. "Understanding Wind Force and Weather Terms from Ships' Logbooks: The English Case." *Climatic Change* 73, 57–77.
<https://doi.org/10.1007/s10584-005-6949-1>.
- Wikipedia. Lighthouses
https://en.wikipedia.org/wiki/List_of_lighthouses_in_South_Africa
https://en.wikipedia.org/wiki/List_of_lighthouses_in_South_Africa.
- Wilkinson, C. 2012. *British Logbooks in UK Archives 17th–19th Centuries: A Survey of the Range, Selection and Suitability of British Logbooks and Related Documents for Climatic Research*. Climatic Research Unit Research Publication 12, 2012 CRU RP 12. University of East Anglia.
- World Heritage Statement of Significance. Accessed June 21, 2019.
http://whc.unesco.org/en/list/1010_UNESCO. World Heritage Site: Statement of Outstanding Universal Value: Land of Frankincense, 39 COM 8E 2015.