

# CLIWOC

Climatological database for the World's  
Oceans 1750 - 1850



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University of East Anglia  
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with the National Maritime Museum, Greenwich

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## NAVAL LOGBOOKS – SOME BACKGROUND

From the earliest days of ocean sailing, mariners have kept accounts of their voyages. Christopher Columbus and the great Portuguese navigators began this tradition that persists to the present day. One of the principal functions of these logbooks was to assist in the navigation of the vessel. This was especially important when ships were out of sight of land and had no points of reference with which to determine their positions. By 1750 the keeping of logbooks was universal amongst the officers of European ships.



## LOGBOOKS IN CLIMATIC RESEARCH

One of the factors that a ship's officer needed to take into account for reliable navigation was the weather. Navigation became a precise science only in the nineteenth century. Before that time more approximate methods were used to determine the true direction of the vessel's course and the distance covered each day. These all required that wind force and wind direction be carefully recorded, the information being then used to determine the 'leeway', made by the ship. Mariners also kept a careful note of other weather phenomena such as rain, thunder, fog and snow. Because observations were made several times each day during the voyage, logbooks contain huge amounts of such detailed information.

## THE ARCHIVES

Many logbooks failed to survive the rigours of life at sea but several thousand have come down to the present day. Some date from as long ago as the seventeenth century. Most frequent amongst the survivors



are the logbooks of vessels in state service. Many thousands have been gathered together in a number of important archives. The United Kingdom,



France, Spain and the Netherlands all possess notable collections. The CLIWOC project is the first attempt at a comprehensive study of this rich source of climatic data. It is curiously ironic that this legacy of the many past wars and conflicts between these nations should offer such an opportunity for co-operative scientific endeavour in this later age.

## PROJECT OBJECTIVES

The principal objective of the CLIWOC project is to realise the scientific potential of logbook climatic data and to produce a database of daily weather observations for the world's oceans between 1750 and 1850. On completion of the project in 2004, this database will be made freely available to the scientific community. Other objectives are:

1. to provide a comprehensive understanding of the nature of climatic change over the oceans for the century after 1750 when logbooks become abundant
2. to provide secondary databases that summarise the character of climatic change at the annual and decadal scales
3. to link with existing data bases that cover the period from 1850 onwards
4. through the particular abundance of information from the North Atlantic region, to refine our knowledge of the behaviour of the NAO at this critical time before climate falls under any marked anthropogenic influence.
5. to stimulate a wider interest in the value of historical documents for climatic research.



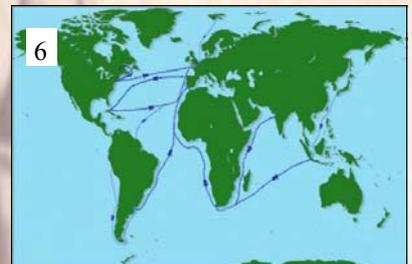
## MAKING SENSE OF LOGBOOK INFORMATION

Logbooks were written by seasoned mariners in the vocabulary unique to their profession and their times. Instruments were only rarely used and interest in the weather was limited to those aspects that influenced the navigation and progress of their ships. Seen through the eyes of the modern-day reader the descriptions of the weather are a mixture of the familiar and curious. Because the records were made to serve the needs of the day, and not those of the twenty-first century scientific enquirer, one of the principal challenges to the CLIWOC team is to interpret the weather vocabulary of former times, and thereby determine the true nature of the weather so assiduously recorded in often difficult circumstances.



## A WORLD-WIDE DATABASE FOR 1750 TO 1850

The CLIWOC database will include daily observations from all the World's major oceanic areas. The North and South Atlantic and the Indian Oceans are well served in this respect but the vast expanses of the Pacific Ocean are expected to yield less information. The published data will be presented in a processed form using terms conforming to present-day usage and understanding. Information will be based on the most frequently recorded elements of wind strength and direction but data will also be provided on a wider range of commonly recorded phenomena that include rain and snow, thunder, fog and even the incidence of sea ice cover. To render the database more manageable annual and decadal summaries will be included. A meta-database will also allow enquirers to trace and consult the original sources. A CD-ROM will be produced not only of the database but also with digital images of the pages of the logbooks that were used in the project.



## TURNING WORDS INTO NUMBERS



Until the closing years of the project's study period, shipboard instruments were an unreliable rarity. The vast majority of the logbook data are therefore in qualitative, descriptive form. This is not however to diminish their scientific value or to deny the possibility of their objective examination by statistical or content analysis. Most logbook entries lend themselves to various forms of frequency analysis. This approach gains added importance as a result of the century-long time span of the project. Within that period it will be possible to see how wind patterns varied, how rainfall frequencies fluctuated even how sea ice advanced and retreated across the frequently-navigated far northern oceans. By these means narrative accounts can be drawn into the arena of scientific debate thereby helping to meet the various CLIWOC objectives.



## APPLICATIONS AND DEVELOPMENTS

In addition to the project's primary objectives, other valuable outcomes will also be achieved. Important amongst these is the insight that the logbooks will give to the question of climatic change over oceanic areas. These cover three-quarters of the Earth's surface, yet no other source provides a means to examine daily weather variations in these areas in the pre-instrumental period. This unique opportunity will be exploited to its fullest potential whilst not overlooking the importance of longer term trends. The results will provide important information for those engaged in assessing climatic change and its possible consequences.



## LINKS WITH OTHER DATABASES

The CLIWOC database cannot claim to be the first attempt to provide a summary of marine-based climatic data. The COADS database (developed in the United States) covers the mid-nineteenth century to the present day and has an international reputation, as do the Japanese Kobe collection and the data assembled at the UK's Hadley Centre. These databases are concerned with instrumental information only. CLIWOC's contribution will be to extend the record of oceanic climate back by a century into the period before instruments were widely used.



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