

Early and National Marine Metadata: Conferences, Codes, Formats, Ship Lists, and Instructions

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1. Introduction

This report discusses various aspects of early and national marine metadata. The discussion is related to efforts to trace the history of the marine ship code (Yoshida, 2007). So far, those efforts have focused on locating WMO documentation, such as the *Manual on Codes* (WMO–No.306; earliest publication date unknown). However, national marine observing instructions even today play an important role, and were likely increasingly influential prior to the establishment of WMO (1950-51), and of its predecessor the International Meteorological Organization (1873). On the other hand, the landmark 1853 Brussels Maritime Conference marks the initiation point for most national observing instructions, even though some earlier instructions are known to exist (e.g., 1848; see Annex). Information about the formats (e.g., early punched card decks) in which marine data have been stored in national archives can also form important metadata. Note: References appear at the end of each section; references preceded by an asterisk (*) are available from NOAA's Climate Database Modernization Program (CDMP), and those preceded by a dagger (†) additionally from icoads.noaa.gov/reclaim/.

Yoshida, T., 2007: History of the marine ship codes. Document submitted to the second session of the JCOMM Expert Team on Marine Climatology (ETMC-II/Doc. 4.2), Geneva, 26-27 March 2007. [Note: see also: goos.kishou.go.jp/ws/ETMC/code_task/.]

2. Earliest maritime conferences

Reports (or the minutes of the proceedings) from the 1853 Brussels conference are available from sources such as Maury (1854), Quetelet (1854), and Maury (1858). Recommended observing instructions in the form of “Explanatory notes,” and/or example log forms, are included in Maury (1851, 1854, 1858).

The 1874 Maritime Conference (1875) reviewed the recommended forms and codes from the Brussels Conference, and agreed on a variety of changes (the US and a few other invited countries did not attend the Conference, but submitted advance written comments). For example, it was recommended in 1874 that the direction and force of the wind be recorded as at the time of observation, rather than “that which has been most prevalent during the eight preceding hours,” as was recommended at Brussels; and that cloudiness observations be switched to proportion (tenths) clouded, from proportion clear.

The 1874 Conference resolved to devise a “general form of Instructions to ensure uniformity in regard of methods of observation and registration,” but also “modified to meet the requirements of different Nations.” Also, it resolved to print for circulation among participating countries a set of detailed English instructions that forms part of the Conference proceedings.

†Maury, M.F., 1851: *Explanations and Sailing Directions to Accompany the Wind and Current Charts*, 3rd Ed., C. Alexander, Printer, Washington, 315 pp. + plates. [Note: Abstract log form on pp. 314-315.]

†Maury, M.F., 1854: *Explanations and Sailing Directions to Accompany the Wind and Current Charts*, 6th Ed., E.C. and J. Biddle, Philadelphia, 772 pp. + plates. [Note: A report from the 1853 Brussels Conference on pp. 54-60; “Minutes of the Sittings” on pp. 60-88; and “Explanatory notes for keeping the abstract log,” and example log forms for men-of-war and merchantmen, on pp. 88-96.]

†Maury, M.F., 1855: *Explanations and Sailing Directions to Accompany the Wind and Current Charts*, 7th Ed., E.C. and J. Biddle, Philadelphia, 869 pp. + plates. [Note: Material related to the 1853 Brussels Conference on pp. 181-212.]

Quetelet, A., 1854: Rapport de la Conférence, tenue à Bruxelles, sur l'invitation du gouvernement des Etats-Unis d'Amérique, à l'effet de s'entendre sur un système uniforme d'observations météorologiques à la mer. *Annuaire de l'Observatoire Royal de Belgique*, **21**, 155-167. [Note: Report in French (a pdf based on a photocopy from the US Naval Observatory library is available); related material might follow on pp. 168-171.]

†Maury, M.F., 1858: *Explanations and Sailing Directions to Accompany the Wind and Current Charts*, 8th Ed., Vol. 1, W.A. Harris, printer, Washington, 383 pp. + plates. [Note: Material related to the 1853 Brussels Conference on pp. 330-383.]

†Maury, M.F., 1859: *Explanations and Sailing Directions to Accompany the Wind and Current Charts*, 8th Ed., Vol. 2, W.A. Harris, printer, Washington, 874 pp. + plates. [Note: Conditions upon which the Wind and Current Charts are furnished to navigators on pp. 870-874.]

†Maritime Conference, 1875: *Report of the Proceedings of the Conference on Maritime Meteorology held in London, 1874, Protocols and Appendices*. Published by Authority of the Meteorological Committee, Official No. 23, HM Stationery Office, London, 61 pp. [Note: "Proposed English instructions for keeping the meteorological log" are included on pp. 46-58, and an example log form appears on the following (unnumbered) page.]

3. Early history of the International Code

The full TDF-13 Reference Manual (AWS, 1960) otherwise concerns land data, but its section on the history of the international code has some relevance to marine codes (e.g., the code figures for wind direction and speed, DD and ff, date back to approximately 1912 and 1949, respectively). (CDMP plans to image the full TDF-13 Reference Manual, if it can be located.)

The 1948 Met Office publication resembles an early *Manual on Codes*. (The Met Office was contacted about this publication, and the Crown Copyright, of 50 years from date of publication, has expired.) AWS (Air Weather Service), 1960: *History of the International Code. Reference Manual TDF 13*. HQ, Air Weather Service (1 September 1960), pp. 0.6-0.10 [Note: Available from NOAA/NCDC.]

*UK Meteorological Office, 1948: *International Meteorological Code Adopted by the International Meteorological Organization, Washington, 1947*. M.O. 509, H.M. Stationary Office, London, 39 pp.

4. Early US and UK card deck and format documentation

The Tape Data Family (TDF)-11 Reference Manual (NCDC, 1968) is a key format reference for early marine data included in ICOADS. In addition, although they are not listed individually here, CDMP has imaged all the original card deck reference manuals that it was able to locate, plus a set of similar early UK Met Office "Series" Manuals. (Note: marine reference manuals, including for the punched card decks used as input to TDF-11, the UK Series, and some marine decks that were destroyed many years ago, are available at icoads.noaa.gov/reclaim/).

†NCDC (National Climatic Data Center), 1968: *TDF-11 Reference Manual*. NCDC, Asheville, NC, 138 pp.

5. Early data sources: miscellaneous documentation

All the Kobe Collection data back to about 1890 were microfilmed under a joint project described by US Weather Bureau-JMA (1960, 1961) (note: only data from the period from 1933 forward were digitized into decks 118-119 during the 1960s).

†US Weather Bureau-JMA: 1960, *Guide Book of the Japanese Marine Surface Data*, US Weather Bureau and Japan Meteorological Agency, 527 pp.

†US Weather Bureau-Japan Meteorological Agency, 1961: *Guide Book of the Japanese Marine Surface Data*, US Weather Bureau and Japan Meteorological Agency, 81 pp.

†Verploegh, G.: 1966, Report of the Consultant on the Historical Sea-Surface Temperature Data Project, 49 pp. plus Annexes. [Notes: The Consultant was to, but the report appears not to have been archived by, WMO. Copies were obtained courtesy of the UK Met Office and KNMI.]

*WMO, 1985: *User's Guide to the Data and Summaries of the Historical Sea Surface Temperature Data Project*. WMO/TD-No.36, MMROA Report No. 13, World Meteorological Organization, Geneva.

6. Historical ship registers and lists

As was suggested at ETMC-I, for ships prior to the introduction of WMO-No.47 in 1955, some overall metadata (e.g., rigging, tonnage, dimensions, propulsion, and Master) could be obtained from sources such as Lloyd's Register of Shipping (some ships back to 1764):

www.lr.org

Or perhaps from on-line compilations based on Lloyd's and other sources, e.g.:

www.reach.net/~sc001198/Lloyds.htm

www.bruzelius.info/Nautica/Nautica.html

7. National observing instructions (except US)

Two editions of 19th century Norwegian observing instructions were translated to English by Erik

Wishman (Woodruff et al., 1999), and are available in digital form (MS Word) but have not yet been made available on the web.

David Parker surveyed UK, US, and a variety of other foreign historical instructions publications, and had translated into English selections primarily focused on SST data. Several years ago David provided copies, or translations, of some observing instructions including Dutch (1866), German (1876, 1878) Italian (1912), Russian (1913), UK (1876, 1890, 1899). Some of these were referenced in Folland and Parker (1995), and an additional list of references exists (Parker, 1993). As discussed in sec. 2, the report from the 1874 Maritime Conference included “Proposed English instructions for keeping the meteorological log.”

Folland, C.K. and D.E. Parker, 1995: Correction of instrumental biases in historical sea surface temperature data. *Q.J.R. Meteorol. Soc.*, **121**, 319-367.

Parker, D.E., 1993: Summary of information on sampling apparatus for sea surface temperature measurement. Hadley Centre Internal Note No. 34.

Woodruff, S., E. Wishman, F. Silva, S. Lubker, and M. Nitter, 1999: Incorporation of the Norwegian ship logbook collection into COADS, in Diaz, H.F. and Woodruff, S.D. (eds.), *Proceedings of the International Workshop on Digitization and Preparation of Historical Surface Marine Data and Metadata (Toledo, Spain, 15-17 September 1997)*. WMO/TD-No.957, MMROA Report No. 43, World Meteorological Organization, Geneva, pp. 99-103. [Note: pdf available from: icoads.noaa.gov/publications.html.]

8. US observing instructions

A partial reference list of US observing instructions appeared in Elms et al. (1993). The Annex provides an expanded list of known documents, of which portions as indicated have been imaged by CDMP.

The primary emphasis in creating the Annex was to seek out observing instructions for Voluntary Observing Ships issued by the Hydrographic Office and later by the Weather Bureau (now NOAA’s National Weather Service; NWS). Even for this category there are some unresolved issues noted in the Annex, and it may be problematic to determine whether the list is complete (absent definitive records, e.g., of Hydrographic Office and Weather Bureau publications).

US Navy ships apparently have operated under separate guidelines, at least during most time periods. NARS (1978) states:

“In the 1860s, after the Bureau of Navigation was created, American naval ships began using official printed logbooks. The Bureau designed the books, issued detailed instructions on their use [...] and began to collect completed logbooks. Before this time there had been no systematic collection of logbooks by the Navy Department; many captains had destroyed the logbooks at the end of a voyage or retained them as personal property.”

Thus a significant number of additional instructions should exist from the US Navy (and probably also from the US Coast Guard).

NARS (National Archives and Records Service), 1978: *List of Logbooks of U.S. Navy Ships, Stations, and Miscellaneous Units, 1801-1947*. Special List 44, available from the National Archives and Records Administration, Washington, 561 pp.

Elms, J.D., S.D. Woodruff, S.J. Worley, and C. Hanson, 1993: Digitizing Historical Records for the Comprehensive Ocean-Atmosphere Data Set (COADS). *Earth System Monitor*, **4**(2), 4-10. [Note: On-line version: icoads.noaa.gov/coads1a.html.]

Annex:
Chronological Lists of Known US Marine Observing Instructions

A. Maury's Abstract Logs and Explanatory Notes

- Maury, M.F., 1848: *Abstract Log for the Use of American Navigators*. Prepared under the direction of Commodore Lewis Warrington, Chief of the Bureau of Ordnance and Hydrography, by authority of Hon. John Y. Mason, Secretary of the Navy, by Lieut. M.F. Maury, U.S.N., Superintendent National Observatory. C. Alexander, Printer, Washington, 10 pp. of Explanations. [Note: Available within the US Maury Collection; imaged by CDMP.]
- †Maury, M.F., 1851, 1854, 1855, 1858-59: *Explanations and Sailing Directions to Accompany the Wind and Current Charts*, 3rd, 6th, 7th, and 8th Eds. [Note: Discussed in sec. 2. Whether the 1st (1847?), 2nd (unknown date?), 4th (1852), and 5th (1853) Eds. contain similar material has not been determined.]
- [Maury, M.F.?], 1853: *Abstract Log for the Merchant Service*, 11 pp. [Note: Available within the German Maury Collection between indexed journal numbers 8168-8169; imaged by CDMP. "Explanatory notes for keeping the abstract log," and an example log for men-of-war (also recommended for the merchant service), resemble those in Maury (1854) (see sec. 2).]
- Maury, M.F., 1855: *Physical Geography of the Sea*. 3rd Ed., Harper & Brothers, New York. [Note: pp. 271-274 document and briefly explain the abstract log forms for a man-of-war and for merchant service.]

B. Hydrographic Office Instructions

- Wyman, R.H., 1877: *Revised instructions for keeping the ship's log-book and for compiling the new meteorological returns*. US Navy Hydrographic Office, Government Printing Office, Washington, 28 pp.
- †US Hydrographic Office, 1878-: *Meteorological Journal Instructions*, Government Printing Office, Washington. [Notes: The full Journal collection, which has been imaged by CDMP, covers 1878-94. Instructions appear on pp. 5-17 of each Journal, with additional pages for illustrations, etc. Six examples of the Instructions, the earliest dated 1878, have been partially re-imaged by CDMP into high-quality PDFs; however, some original color pages remain to be imaged. Proposed English instructions included in the 1874 Maritime Conference proceedings (sec. 2) seem to have influenced the Journal Instructions, e.g., some illustrations are identical.]
- *Page, J., 1901: *Instructions to the Voluntary Meteorological Observers of the U.S. Hydrographic Office*. Hydrographic Office No. 119, Government Printing Office, Washington, 39 pp. [Note: A 1903 edition of abbreviated "Instructions to Observers" (found attached to observational forms) refers to H.O. 119.]
- Page, J., 1904: *Instructions to the Voluntary Meteorological Observers of the U.S. Hydrographic Office*. Hydrographic Office No. 119, Government Printing Office, Washington, 40 pp.

C. Weather Bureau/NWS Instructions

- *Page, J., 1906: *Instructions to the Marine Meteorological Observers of the U.S. Weather Bureau*. [Circular M, 1st Ed.], Government Printing Office, Washington, 46 pp.
- *Heiskell, H.L., 1908: *Instructions to the Marine Meteorological Observers of the U.S. Weather Bureau*. W.B. No. 397 [Circular M, 2nd Ed.], Government Printing Office, Washington, 48 pp.
- *Heiskell, H.L., 1910: *Instructions to the Marine Meteorological Observers of the U.S. Weather Bureau*. W.B. No. 444 [Circular M], 3rd Ed., Weather Bureau, Washington, 68 pp.
- *US Weather Bureau, 1925: *Instructions to Marine Meteorological Observers*. W.B. No. 866, Circular M, Marine Division, 4th Ed., Government Printing Office, Washington, 99 pp. [Note: Editions prior to the 4th were not issued as Circular M, and those prior to the 3rd Ed. did not have the edition identified.]
- *US Weather Bureau, 1929: *Instructions to Marine Meteorological Observers*. W.B., No. 991 (issued November 1929), Circular M, Marine Division, 5th Ed., Government Printing Office, Washington, 80 pp.
- *US Weather Bureau, 1938: *Instructions to Marine Meteorological Observers*. W.B. No. 1221 (issued January 1938), Circular M, Marine Division, 6th Ed., Government Printing Office, Washington, 120 pp.
- *US Weather Bureau, 1941: *Instructions to Marine Meteorological Observers*. W.B. No. 1221 (issued June 1941), Circular M, 7th Ed., Government Printing Office, Washington, 114 pp.
- *US Weather Bureau, 1948: *Instructions for Recording and Coding Marine Meteorological Observations in the New International Code, Effective January 1, 1949*. Provisional Edition, Weather Bureau, Washington, 36 pp. plus Appendix (xi pp.).
- *US Weather Bureau, 1950: *Manual of Marine Meteorological Observations*. Circular M, 8th Ed., Government Printing Office, Washington, 100 pp.
- *US Weather Bureau, 1954: *Manual of Marine Meteorological Observations*. Circular M, 9th Ed. (January 1954), Government Printing Office, Washington, 86 pp.
- *US Weather Bureau, 1959: *Manual of Marine Meteorological Observations*. Circular M, 10th Ed. (January 1959), Government Printing Office, Washington, 127 pp. [Note: Revised at least twice: March 1960 to

include Change No. 1, and September 1962 to include Change No. 2 (11 pp., available as a separate document from CDMP).]

- *US Weather Bureau, 1963: *Manual of Marine Meteorological Observations*. Circular M, 11th Ed. (January 1963), Government Printing Office, Washington, 133 pp.
- *US Weather Bureau, 1964: *Manual of Marine Meteorological Observations*. Circular M, 12th Ed. (March 1964), Government Printing Office, Washington, 133 pp.
- US Weather Bureau, 1969: *Marine Surface Observations*. Weather Bureau Observing Handbook No. 1, 1st Ed. (Reprinted December 1970), Silver Spring, MD, 43 pp.
- US National Weather Service, 1971: [Note: Cited in Elms et al., 1993; details unknown.]
- US National Weather Service, 1982: *Marine Surface Weather Observations*. National Weather Service Observing Handbook No. 1, Silver Spring, MD. [Note: Cited in Elms et al., 1993; NCDC Library, QC871.4.WR no. 1.]
- US National Weather Service, 1991: *Marine Surface Weather Observations*. National Weather Service Observing Handbook No. 1 (July 1991), Silver Spring, MD.
- US National Weather Service, 1992: [Note: Cited in Elms et al., 1993; details unknown.]
- US National Weather Service, 1995: *Marine Surface Weather Observations*. National Weather Service Observing Handbook No. 1 (August 1995), Silver Spring, MD.
- US National Weather Service, 1999: *Marine Surface Weather Observations*. National Weather Service Observing Handbook No. 1 (August 1995 Ed., revised April 1999), Silver Spring, MD.
- US National Weather Service, 2002: *Marine Surface Weather Observations*. National Weather Service Observing Handbook No. 1 (August 1995 Ed., revised July 2002), Stennis Space Center, MS.
- US National Weather Service, 2004: *Marine Surface Weather Observations*. National Weather Service Observing Handbook No. 1 (July 2004), Stennis Space Center, MS. [Notes: pdf available from: www.nws.noaa.gov/om/marine/pub.htm. Inclusion of images from Environment Canada may preclude offering the publication (including earlier editions) for sale.]

D. Weather Bureau Miscellaneous Instructions

- *Weather Bureau, 1931: *International Code for Radio Weather Reports from Ships*.
- *Weather Bureau, 1933: *International Code for Radio Weather Reports from Ships*.
- *Weather Bureau, 1938: *International Code for Radio Weather Reports from Ships*.
- *Weather Bureau, 1940: *International Code for Radio Weather Reports from Ships*.
- Weather Bureau, 1948a: *Instructions for Meteorological Personnel Assigned to Weather Ships*. W.B. No. 1362, Circular T (April 1948), 9th Ed., Weather Bureau, Washington. [Note: The inside cover identifies preceding editions published in 1940-46.]
- *Weather Bureau, 1948b: *International Code for Radio Weather Reports from Ships (Effective 1 January 1949)*. W.B. No. 1046 (Revised), Government Printing Office, Washington, 24 pp.
- National Weather Service, 1991: *Ships' Code Card*. National Weather Service Form No. WS TA B-0-7 (9-91). [Notes: Other editions of the (poster-sized) "Code Cards" were prepared as a supplement to Observing Handbook No. 1; a few are available at the NCDC Library.]

E. US Navy and Coast Guard Instructions

- Bureau of Navigation, 1866: Directions for Keeping the Ship's Log. Summary Instructions in: National Archives and Records Service, 1978, *List of Logbooks of U.S. Navy Ships, Stations, and Miscellaneous Units, 1801-1947*, Special List 44, available from the National Archives and Records Administration, Washington, 559-562.
- Bureau of Equipment, 1891: Directions for Keeping the Ship's Log. Circular Instructions, Bureau of Equipment, Navy Department, September 23, 1891. [From the National Archives and Records Administration.]
- Coast Guard, c. 1940: Instructions for Keeping the Ship's Log. Ship's Log Book, Form 2610, Treasury Dept., US Coast Guard, 3-5.
- US Navy, c. 1944: Instructions for Keeping the Ship's Log. [Note: In use for the approximate period 1 June 1944 through 1945.]
- US Navy, [current?]: *United States Navy Manual for Ship's Surface Weather Observations*. NAVMETOCCOMINST 3144.1D.